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User Research in Commercialization - Why and How

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Abstract

User and customer interaction has been recognized vital for the success of new products. User research that aims to understand the user's life, emotions, and dreams, is usually done in the front end of innovation, and in the product development phase. However, commercialization phase relies on market research that provides numerical and generalized results. Previous literature uncovers some benefits of utilizing user research methods also during commercialization activities, but the findings are scattered.

This study explores what types of benefits companies can achieve from conducting user research during commercialization. Furthermore, this study examines which user research approaches companies use, and what kind of knowledge these methods produce. The study was conducted as a multiple case study at four Finnish B2B industrial companies. One of these companies was studied more closely with an action research approach. The end users of their product were studied with a diverse set of methods in order to evaluate the applicability of user research approaches in practice.

Complementing the scattered findings of the literature, this study suggests a new model called Value Wheel which classifies the benefits of user research. The model demonstrates the different types of benefits a company can seek when planning for user research in commercialization. Furthermore, this study shows that companies should utilise observational and participatory methods in addition to the traditional market research methods. Using a diverse set of methods enables a comprehensive understanding of the users. What is more, this study suggests an extension to a classification of user research methods, and further divides the methods depending on whether they involve end users directly or indirectly.

Keywords Innovation Management; Commercialization; Product Innovation; Customer and User Interaction; User Research; Empathy; Multiple Case Study

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Tiivistelmä

Menestyvien tuotteiden kehittäminen vaatii vuorovaikutusta asiakkaiden ja käyttäjien kanssa. Käyttäjätutkimusmenetelmiä, joilla tutkitaan käyttäjän elämää, tunteita ja toiveita, käytetään yleisimmin innovaatioprosessin alkupäässä ja tuotekehitysvaiheessa. Kaupallistamisvaiheessa hyödynnetään pääasiassa markkinatutkimusmenetelmiä, jotka tuottavat numeerista ja yleistävää tietoa käyttäjistä. Aikaisemmat tutkimukset ovat tunnistaneet joitakin hyötyjä käyttäjätutkimusmenetelmien soveltamisesta kaupallistamisvaiheessa, mutta löydökset ovat hajanaisia.

Tässä tutkimuksessa otetaan selvää, mitä hyötyä yritykset kokevat saavuttavansa tehdessään käyttäjätutkimusta kaupallistamisvaiheessa. Lisäksi tutkimuksessa tarkastellaan, millaisia menetelmiä yrityksissä hyödynnetään ja minkälaista tietoa menetelmät tuottavat. Tutkimus toteutettiin neljässä suomalaisessa teollisuuden B2B-yrityksessä, joista yhtä tarkasteltiin lähemmin. Tämän yrityksen tuoteinnovaatiota tutkittiin toimintatutkimusosuudessa, jossa kokeiltiin erilaisia käyttäjätutkimusmenetelmiä käytännössä ja arvioitiin menetelmien soveltuvuutta kaupallistamisvaiheeseen.

Tutkimus täydentää aikaisempia löydöksiä esittämällä Arvoratas-mallin, joka jaottelee tutkimuksessa tunnistetut käyttäjätutkimuksen hyödyt. Malli auttaa yrityksiä arvioimaan, millaista hyötyä he voivat saavuttaa suunnitellessaan uutta käyttäjätutkimusta kaupallistamisvaiheessa. Tutkimus kannustaa yrityksiä hyödyntämään perinteisten markkinatutkimusmenetelmien lisäksi havainnointia ja osallistavia menetelmiä. Tämä mahdollistaa kattavan ymmärryksen käyttäjistä. Lisäksi tutkimus esittää käyttäjätutkimusmenetelmien jaotteluun laajennusta, joka edelleen jakaa metodit sen mukaan, osallistetaanko tutkimuksessa loppukäyttäjiä suoraan vai välillisesti.

Avainsanat Inovaatiojohtaminen; kaupallistaminen; tuoteinnovaatio; asiakas- ja käyttäjävuorovaikutus; käyttäjätutkimus; empatia; monitapaustutkimus

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Glossary of used terms

Table 1: Glossary of terms used in the study.

Term	Description
Innovation	A new and commercially successful idea converted into a practical format (Trott, 2005).
Innovation process	Process model for managing innovations. Often described to consist of three phases: front end, development and commercialization (Koen et.al. 2001).
Commercialization	“Set of business activities, tasks, and actions that run in parallel with ideation and product development processes and complete them so that a new product can become commercially viable, tradable, and eventually successful on the market” (Simula 2012, p. 111).

Launch	The event of introducing the product to the market the first time (Cooper, 2001).
Product	“A product is, to the potential buyer, a complex cluster of value satisfactions. The generic thing or essence is not itself the product.” (Levitt 1986, p. 77.)
User	Term is used in the field of human centered design (e.g. International Organization for Standardization, 2009; Huotari, et.al 2003) and ergonomics (e.g. Stanton and Young, 1999). It focuses to the person using the system, and the context of use (International Organization for Standardization, 2009).
Customer	Term is used in the management literature (e.g. Cooper, 2001; Ulrich and Eppinger, 2012). The focus is the person or a company who pays for the offering.
Consumer	Term is used of a customer who is an individual person (Hippel, 2004).
Empathy	Empathy means the capability of imagining oneself in the position of someone else (Mattelmäki, 2006).
Custom wallpaper	Wallpaper that has a pattern custom designed or selected by the customer. These wallpapers are printed with digital printers.
Digital wallcovering	Wallcovering material that is printable with digital printers, and used to print custom wallpaper.

1 INTRODUCTION

This chapter introduces the background and interest for conducting this study. Furthermore, the research problem and questions will be explained. In addition, the chapter presents the scope of the study, the research methodology and the structure of the thesis.

1.1 Background

Understanding user and customer needs is seen as one of the most important factors for the success of new products (e.g. Cooper, 2001; Gruner and Homburg, 2000; Maidique and Zirger 1986). Nevertheless, being able to define the product specifications that meet user and customer needs is not enough. Products have to compete beyond their technical qualities, because customers desire personal experiences (Pine & Gilmore, 1999). To design for these experiences, companies must understand their customers on a level of emotions, dreams, and future needs (Sanders and Dandavate, 1999). This requires companies to develop new skills, and study their customers through empathic design (Leonard and Rayport, 1999).

Utilising empathic design approaches to understand the customer's latent and future needs is embraced in the front end of innovation (Koskinen, 2003). However, in commercialization where business critical decisions on targeting and positioning are made (Crawford and Di Benedetto, 2003), the user and customer research relies on traditional market research methods (Cooper, 2001). These methods tell what our customers say they need (Visser, et.al. 2005), and lead to generalised results of a large group of people (Hanington, 2003). Utilising only market research methods has several drawbacks. They offer a limited representation of the real-life context (Leonard and Rayport, 1999), and a poor evaluation of the purchase behaviour (Ogawa and Piller, 2006). Purchase decisions are mostly influenced by feelings and only slightly by rational thinking (Zaltman, 2003). The thoughts and feelings happen unconsciously, and are therefore difficult to articulate (Zaltman, 2003). Thus they are hard to catch with traditional market research methods. There should be a good reason to believe that commercialization could also benefit from the empathic design approaches that help to understand the customers on a deeper level of people's individuals lives, emotions, dreams and future needs.

This study explores what kind of value new user understanding provides in the commercialization of a product, and in what way the user research should be done. This study was conducted as a multiple case study in collaboration with four large

scale Finnish industrial companies. Three of the companies were studied on a more general level in order to form a broad conception of the possible benefits, and the existing practices of user and customer research in industrial companies. The fourth company was studied more closely, and the applicability of user research methods was explored in the case of their newly launched product called Digital Wallcovering. This product was a new type of a wallcovering material that is easy to apply on the wall, and it was sold to digital printing companies that print customised wallpapers for consumers and professionals.

1.2 Research problem and objectives

The research problem of this study is as follows:

Could product commercialization be supported with user understanding derived from new user research?

The research problem will be examined in three phases: literature review, empirical research and discussion. The literature review is focused on the acknowledged value of user and customer interaction during the whole innovation process, but also on the potential value of new user research in the commercialization phase. The empirical research is focused around the daily practices of interacting with users and customers in industrial companies, and examining the value of new user research done in the Digital Wallcovering case provided by focal company A. Finally, the discussion focuses on the synthesis of the literature and empirical research, providing implications for companies and future research.

The research problem will be studied in more detail through the following three research questions:

Q1) What is the role of users and customers during the innovation process?

This thesis clarifies the differences between the terms user and customer in innovation process, and the various roles they are given. In particular, the literature review provides insights to how the selection of one term or the other makes a difference in a discourse. The empirical research done at the focal and benchmark companies supports the literature by examples of varied ways of using the terms. Additionally, the research identifies possible challenges caused by ambiguous use of the terms.

Q2) What kind of value could new user research bring in commercialization?

To understand the potential value of user and customer interaction in commercialization, the literature review first considers the value for the whole product success in general. Further, a deeper inspection on the benefits for commercialization is presented, and the potential benefits of integrating empathic

design research methods in commercialization is discussed. The empirical research at the benchmark companies again supports the literature research by examples of the value of user and customer interaction in an innovation process. The value of interaction in a specific phase could not be studied in benchmark companies, because a limited amount of interviews were conducted per company, and no follow up on a specific case was done.

More focused inspection on the value for commercialization will be examined in the focal company research, and during the new user research done for the Digital Wallcovering case. Specifically, it is explored, why new user research is needed in the case, and what are the company's beliefs on its potential benefits. To examine the fulfilment of these beliefs, new user research is conducted for the Digital Wallcovering case, and the potential value of its findings is discussed. The realised value of the findings cannot be explicitly evaluated, as this study does not extend to follow the Digital Wallcovering case for a long period of time.

In the discussion, the values of user and customer interaction in commercialization that were recognised in the literature and empirical research are classified in a model called Value Wheel. The value Wheel illustrates the diversity of values, and demonstrates how the findings of the literature and empirical research complement each other but to some extent also differ from each other.

Q3) How should users be studied in commercialization? Which approaches should be applied to the focal company case?

The literature review provides an extensive analysis of different kinds of user and customer research approaches. More specifically, the type of knowledge the different approaches produce will be discussed. Further, the shortcomings of relying on the traditional market research methods are presented, and the potential benefits of utilising empathic design research methods in commercialization are examined. The literature review also gives guidance on how the methods for user and customer research should be selected.

The benchmark company study also gives recommendations for interacting with users and customers during innovation activities. Furthermore, examples of useful methods for commercialization are presented. The focal company study draws together reasons that can hinder the effective use of user and customer knowledge. Additionally, restrictions for choosing the applicable user and customer research methods to be used in commercialization are discussed.

Finally the new user research done for the Digital Wallcovering case examines the applicability of three methods in practice. The nature of the findings, as well as the advantages and disadvantages of applying the methods are discussed. As a conclusion, the focal company A is given suggestions what kinds of methods they

could take into use, and how they should apply the user centricity in the commercialization phase of the Digital Wallcovering case.

1.3 Scope of study

The context of this thesis is defined by the companies and the business case of the focal company A. These are industrial companies who operate in the business to business market. Because the Digital Wallcovering was in the commercialization phase at the time of this study, the focus is in product innovation processes, with a special focus in commercialization phase. Because of the interest to study users and customers in the Digital Wallcovering case, the literature of user centered design and research is taken into discussion.

The scope does not include the inspection of the earlier phases of innovation process, meaning the front end or product development phases. Neither are the commercialization of technology innovations, or services taken into focus. Further, the scope excludes the marketing and sales literature, because the literature of product commercialization already provides an extensive overview on activities related to marketing and sales.

1.4 Research methodology

A multiple case study approach was chosen to examine the role of users in industrial companies, adapting Eisenhardt's (1989) inductive theory building approach. Using multiple sources and various methods for collecting data enables a broad understanding of a topic, and builds the validity of results (Eisenhardt, 1989). The inductive theory building approach is used for building new theory from case data, in contrast to testing existing theory with data (Eisenhardt and Graebner, 2007).

The interest for the research topic was motivated by the business case at the focal company A. The company A had an interest to gain more understanding of the end users in the possible market of the new product. In the beginning of the study research question was formalised, in order to have a clear focus for the study: *could product commercialization be supported with user understanding derived from new user research.*

In the beginning of the study, previous research was reviewed in order to get an understanding how end users had been involved in commercialization before. User centered design and innovation management were the two main research fields to be reviewed at this stage. The literature review indicated a scarcity of previous research discussing the application of user research methods in the commercialization phase of an innovation process. The literature was first reviewed on a rough level and the focus of it was refined as the empirical research proceeded. The methodology of the literature review will be explained in more detail in chapter 1.4.1 Literature review.

The empirical research focuses around one focal company A, and three benchmark companies B1, B2 and B3. All the case companies A, B1, B2 and B3 operated in industrial business, but they possessed different positions in their value networks.

The empirical research was started with conducting the first interviews at the focal company A. The aim of the first interviews was to gain an understanding of the situation at hand at the company. Next, three suitable benchmark companies were selected for conducting comparable interviews, and to provide knowledge to analyse the situation at the focal company A. The aim of the benchmark interviews was to understand the current practices, and the potential needs on how they study their users and customers. In the benchmark companies the users and customers were interacted with in different stages of innovation processes, they had more or less established role, and were studied with various approaches. The interviews done at the focal and benchmark companies will be discussed in more detail in chapter 1.4.2 Interviews.

Eisenhardt (1989) recommends that the selection of cases should be done for theoretical reasons instead of random statistical sampling. The number of three benchmark companies and one focal company was considered sufficient, because they represented a good variety of different profiles of customers and products. Additionally, the cases needed to be selected carefully and the number of cases needed to be limited, because the duration of this study was only six months. In future research it would be beneficial to validate the phenomenon statistically with a greater number of cases.

The focal company A provided the Digital Wallcovering case for studying the role of end users and customers in the commercialization phase of a new product. The case provided an opportunity for conducting action research at the focal company A, and to study the end users and customers of the custom wallcoverings using varied user research approaches. Locke (2001) summarises action research as a practice, where researcher temporarily involves in the organisation with a dual purpose to develop the organisation's competences, and to advance scientific knowledge. Action research consists of defining the problem and research design, conducting the study, interpreting the data, and identifying the newly generated learnings (Elden and Chisholm, 1993). The aim of the action research was to find out whether it is possible to find new and interesting information about the end users still in the commercialization phase. Three different user research methods were chosen in collaboration with the focal company A to explore the applicability of the methods extensively, and to reach a potential for generalised conclusions. The user research of the case will be discussed in more detail in chapter 1.4.3 New user research.

This study utilised semi-structured interviews as a core research method, to gather data from the focal company and benchmark companies. The study also included an action research phase, where the applicability of user research approaches were explored in practice. The whole study was conducted during six months. The time was divided into following parts approximately according to the table 2 below.

Table 2. Timeline of the study.

	1st month	2nd month	3rd month	4th month	5th month	6th month
LITERATURE REVIEW	X	X		X	X	
INTERVIEWS						
Focal company interviews		X	X			
Benchmark company interviews		X	X			
Analysis of interviews				X		
NEW USER RESEARCH PHASE						
Business customer interviews			X			
Netnography			X	X		
Interactive feature conceptualisation				X		
Analysis of user research					X	
CONCLUSIONS						X

1.4.1 Literature review

Eisenhardt (1989) describes an ideal, where the theory-building research should be started with no theoretical framework or predefined hypotheses because they might lead to a biased and limited perspective. In truth, this ideal is impossible to achieve perfectly but should be aimed at (Eisenhardt, 1989). This advice of keeping an open perspective was set as a guideline in this study. Nevertheless, a research focus needed to be defined due to the limited time resources. The focus was set by conducting a brief literature review in the beginning of the study.

At first the literature was reviewed on a rough level, in order to get familiar with the current discussion on customer and user interaction in innovation activities. Being aware of the latest discussion was helpful for conducting the interviews at the focal and benchmark companies as it was easier to understand their activities and strategy, and to put them on a broader context. The literature was narrowed down to examine the overlap between user centered design, and the commercialization phase

of an innovation process. This created a general interest for the empirical research phase, because these two topics were rarely discussed together in one publication. After the interviews were concluded at the focal and benchmark companies, and reviewed for analysis, the literature was taken into more detailed inspection. The central scholars were chosen amongst innovation management and design literature.

The trustworthiness of a publication was evaluated primarily based on the number of citations in Google Scholar, but also reviewing how high the journal was listed in the SCImago journal ranking. Publications that have been cited frequently can be considered to have a great influence in its research stream (Tahai and Meyer, 1999). In addition to evaluating the popularity of a single publication, SCImago journal rank is helpful for evaluating the value of journals based on its prestige, and not only its popularity (Moed, et.al, 2012). In this thesis, the publications that had several hundreds of citations in Google Scholar, and they were listed rather high (amongst the first third) in the SCImago journal rank from 2013 for all research areas, were considered as the building blocks in their research stream.

From all the publications included in this study, there were eight articles that had less than one hundred citations. These articles were used only as a supportive material in the literature review. Of these eight articles, six were published in journals that were listed rather high in the SCImago journal rank. Therefore they can still be considered to be of relevance in their research stream. A small number of citations can be a result from many different things. It can indicate that the article does not have a great appreciation in its research stream, the publication is from a recent year, it is not openly accessible, or it represents a niche research stream.

The main search tools for finding relevant articles were Google Scholar and EBSCOhost, because they cover various research disciplines extensively. The key search terms included user research, user involvement, customer, empathy, launch, commercialization, sales, and innovation process. As the topic of this study is not extensively studied in the literature, the references of the most central articles were carefully examined in order to find more relevant publications. Each found article was systematically listed in a spreadsheet. For each article its key conclusions, relevance to this study, and number of citations were written down. The most promising articles were printed out and read in more depth. In all somewhat 250 articles were read through in more depth, and of those 60 were included in this literature study.

1.4.2 Interviews

The focal company A representatives were interviewed in order to gather information of the Digital Wallcovering case, and the processes and practices around their innovation activities in general. Furthermore, it was studied what is the role of users and customers in the company, what kind of knowledge they possessed from users and customers of the Digital Wallcovering, and what kind of new knowledge is needed. Altogether ten semi-structured interviews were conducted at the focal

company A, and the length of each interview was 60-120 minutes. The interviewees were from different departments and locations across the whole organisation, and the interviews were conducted either by phone or face-to-face. The interviews were done together with a research colleague. Six of the interviews were not attended by the researcher of this thesis, but conducted prior to the start of this study as part of a greater research project. The methodology of the focal company interviews will be explained in more detail in chapter 4.1.

In order to gather comparable data on how end-users are studied in other industrial companies, six interviews were conducted at three comparable industrial companies - two at each. The duration of these interviews were 60-120 minutes. Three of the interviewees were working with developing new products, and three interviewees worked in sales or marketing. The methodology for interviewing the benchmark companies will be explained in more detail in chapter 3.1. Additionally one specialist interview was conducted in order to increase the reliability of the findings and conclusions of the empirical research. The specialist was a post-doctoral researcher who studies user centricity in industrial companies. The length of the specialist interview was 60 minutes.

The interviews were semi-structured, and consisted of open-ended questions. A semi-structured interview consists of well prepared but open questions, and requires many of the interview questions to be improvised in the actual interview situation (Wengraf, 2001). The interview structure used in the company interviews can be found in the Appendix A1 and A2. The interview structure was developed as new viewpoints of interest emerged in the interviews. Eisenhardt (1989) favors the alteration of data collection methods during the research, as the understanding on the unexplored topic increases. This approach seems sensible, as in the beginning it cannot be yet predicted which finding to arise will be of most value. The extent of the interview material is displayed in the following table 3.

Table 3. The amount of material yielded from the interviews at the focal company, at three benchmark companies, and with one expert.

	<i>Number of interviews</i>	<i>Amount of material</i>
Focal company interviews	10 (60-120 min)	102 sheets
Benchmark company interviews	6 (60-120 min)	64 sheets
Expert interview	1 (60 min)	8 sheets

1.4.3 New user research

In order to study end-users in the case context, three user research approaches were selected and applied in practice. The purpose of action research is to produce

knowledge that benefits both the company and scientific research (Locke, 2001). The action research phase was done in order to evaluate what kind of knowledge user research approaches could produce for the Digital Wallcovering case, and if the knowledge is valuable still in the commercialization phase. Through the analysis on how the approaches serve the Digital Wallcovering case, conclusions for academy are drawn.

The methods included semi-structured interview (Wengraf, 2012), netnographic research (Kozinets, 2002), and interactive feature conceptualisation (Bauersfeld and Halgren, 1996). The semi-structured interview was done with two business customers, and the length of both interviews was 60 minutes. The netnographic research included inspecting 325 Finnish customer reviews in an online review site of a company printing wallpapers digitally, and reviewing 20 blogs related to wallpapers and decoration. The interactive feature conceptualisation method was combined with four individual interviews done at end users' homes. The duration of each session was 60-120 minutes.

The methodology of the three user research methods will be explained in more detail in chapter 5.1 New user research on custom wallpapers, Methodology. The extent of the user research is explained in the following table 4.

Table 4. Count and length of the used user research methods.

	<i>Number of interviews or reviews</i>
Business customer interviews	2 (60 min)
Online customer reviews	325
Blogs	20
Interactive feature conceptualisation sessions	4 (60-120 min)

1.4.4 Analysing the results

As advised by Eisenhardt (1989) the researcher should first analyse each case individually, which allows the findings of an individual case to arise before generalising the findings of all cases. This advice was followed when analysing the interviews done at the focal company and benchmark companies. The interviews were processed carefully from one company at a time in order to gain an understanding of the company's activities. The most interesting findings were highlighted, and the key answers to the interview questions were written on sticky notes. These notes were placed on a flip chart without yet organising them.

A cross-case analysis is recommended as the second step of the analysis phase by Eisenhardt (1989). At this stage the sticky notes were organised in clusters on a wall. This process is similar to affinity diagramming introduced by Holzblatt and Beyer (1993), which is often used to create a common understanding of a subject in a team. An affinity diagram is useful for making the data easily understandable, finding similarities and dissimilarities between the cases, and also for finding the weak spots that have not been covered in the interviews (Holzblatt and Beyer, 1993). Comparing the cases and looking for similarities and dissimilarities between them can help the researcher to see new categories and concepts (Eisenhardt, 1989).

A similar two-step-analysis approach was used when analysing the performance of the user research methods in the case of Digital Wallcovering. First each method was analysed individually to evaluate the newness of the information, and the adaptability of the methods to the company restrictions. Second, these insights were organised in a table to see similarities and differences between each method. These insights are included in the appendix, but not closely analysed in this thesis, because the focus was in the performance of the methods, and not in the subject studied with the methods. As a deliverable to the focal company A, the new understanding obtained from the end users was delivered in a comprehensive presentation. The presentation consisted of both conclusions, as well as quotations and pictures from the research situations. Utilising the original research material in presentation helps the recipients to visualise, and to get a grasp on the users' lives (Mattelmäki, 2006).

Finally, the findings to each research question derived from all the sources of study were compared next to each other in a big table (see appendix E). This showed where the findings differed from and supported each other, and how the empirical research supplemented the literature with new understanding.

1.5 Structure of thesis

The structure of the thesis is as follows. In chapter 2 the literature review provides an overview to product innovations and specifically to the commercialization of the products. Further the role of users and customers in innovation process is discussed. The value of user and customer interaction for the product success is examined, giving a special focus to the commercialization phase. The literature review continues with an analysis on the different approaches to study users and customers. The limitations of market research methods are explored, as commercialization phase usually relies on using them. Further it is discussed how empathic understanding could complement the limitations of traditional market research. Finally, conclusions of the whole literature review is presented.

The chapter 3 focuses on the empirical research done at the three benchmark companies. First the methodology of conducting the interviews at the benchmark companies will be clarified. The findings from each company are compared and discussed. The topics of the results include the role and value of users and customers in innovation process, as well as approaches and recommendations for studying

users and customers. The chapter 3 is ended with conclusions of the most important findings from the benchmark company studies.

In chapter 4 the focus is in the Digital Wallcovering case of the focal company A. The chapter starts with explaining the methodology, and continues with more detailed description of the Digital Wallcovering case. The results of the focal company study is divided into two. First the drawbacks caused by low amount of user understanding are discussed. Second the potential value of conducting new user research is evaluated. Again, this chapter ends with conclusions of the most important findings of the focal company study.

The fifth chapter starts by explaining how the new user research was done. The three methods chosen for studying the users of the Digital Wallcovering case are introduced. The results disclose what were the perceived advantages and disadvantages of the methods, what kind of knowledge the methods produced, and what was the value of the new user research for the focal company A. Finally the most important findings are concluded.

The chapter 6 discusses how the research problem and the research questions were answered by the literature and empirical research. Further the contribution of new academic understanding, and suggestions for future research are discussed. The implications for companies, and the limitations of the research are presented. Finally chapter 7 concludes what was researched in this thesis, and what were the most important results. The references and appendices are placed at the end of this thesis.

2 LITERATURE REVIEW

The literature review introduces the main concepts of innovation management, and the the various different ways of interacting with users and customers during an innovation process. More specifically, it illustrates the differences between the different types research practices of traditional market research, user centric research, and design research. The benefits of applying different user and customer research methods in the commercialization phase are discussed. Further, guidelines for choosing the applicable user and customer research methods will be explored.

The focus of the literature review follows the interests of the whole research. Hence, the discussion is framed in developing new products instead of services. The targeted companies are large and established in contrast to small companies. The degree of innovation in focus is new and radical products rather than incremental enhancements of existing products. The users to be studied are the end users and consumers, meaning the business customers are considered as sources of information on their customers, and not as subjects of study themselves.

Chapter 2.1 starts the literature review by describing a product innovation process, and specifically the commercialization of the products. Chapter 2.2 concentrates on defining the role of user and customer in innovation process, and to recognize what kind of value user and customer interaction produces for the product success, especially when the interaction happens in commercialization. Chapter 2.3 continues with an analysis on different approaches to study users and customers. The limitations of market research methods are explored, and the possible benefits of adding empathic understanding to complement these limitations are discussed. Finally the findings of the literature review will be concluded in chapter 2.4.

2.1 Product innovation process

2.1.1 Innovation process models

The innovation process for new products is commonly divided into three major phases: front end, new product development and commercialization (Koen, et.al, 2001). According to Koen, et.al (2001) the front end of innovation is the unpredictable and unstructured phase preceding the more formal product development phase. They have defined five key activities for the phase: opportunity identification, opportunity analysis, idea genesis, idea selection, and concept and technology selection (Koen, et.al. 2001). To describe the second phase, Ulrich and

Eppinger (2012) define six steps for a product development process: planning, concept development, system-level design, detail design, testing and refinement, and production ramp-up. Finally to describe the third phase, according to Simula (2012) commercialization means the set of business activities that prepare the product to become successful in the market, such as trial production, marketing, sales, and launch. The three phases of innovation process overlap in the activities they contain, and therefore the division into these phases should be considered only as a high-level concept, and not as a strict rule.

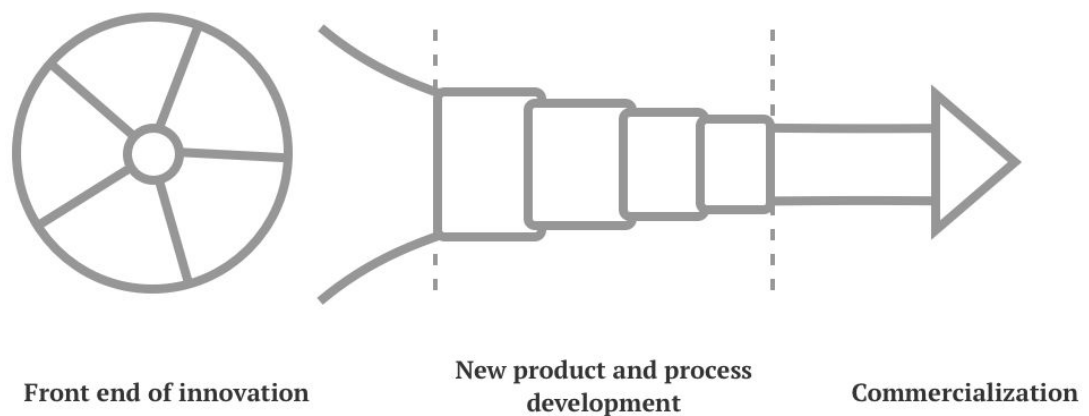


Figure 1. Three phases of an innovation process (adapted from Koen, et.al. 2001).

Cooper's (1990) Stage-Gate System is one of the best known process models for innovation processes. Even today in most manufacturing companies, the innovation process resembles the Cooper's Stage-Gate System (Cooper, 2009). The Stage-Gate System consists of stages that contain predefined activities, including scoping and building the business case, development of the product, testing, production and launch. Each stage is preceded by a gate, where the project is reviewed and decisions on further actions are made. (Cooper, 1990.) Cooper's and Koen's et.al. models include somewhat the same phases of the process, but they differ in degree of detail when describing them. Cooper's model gives a more specific description on the steps of the innovation process and its activities, while Koen's model is more of a high level representation of the nature of the major phases included in the process.

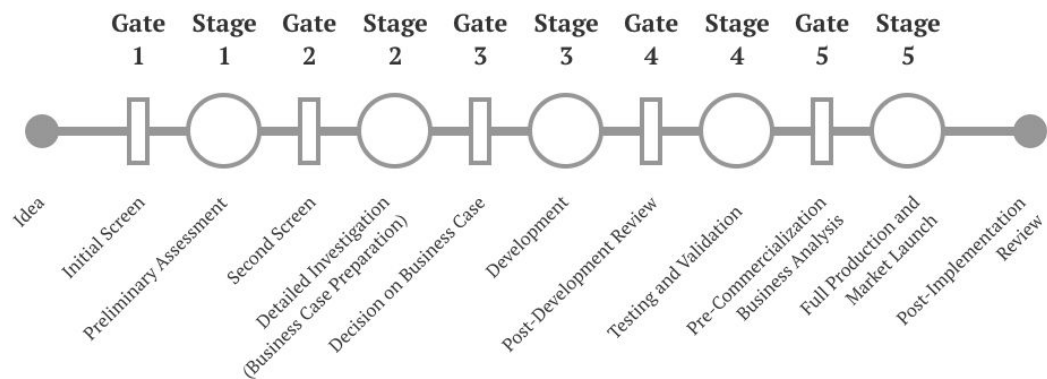


Figure 2. Cooper's (1990) Stage-Gate System (adapted).

Despite the common linear presentation of the innovation process, the three phases are not strictly separate, but happen in parallel and in cycles. The front end of innovation is probably the most cyclical phase of the innovation process. Koen, et.al. (2001) suggest that in front end of innovation “ideas are expected to flow, circulate and iterate and among all the five elements, in any order or combination, and may use one or more elements more than once” (Koen, et.al. 2001, p. 48). Khurana and Rosenthal (1997) complement that the activities of the front end phase should be seen strongly interrelated, and be approached rather as a system instead of individual steps. Again in product development stage, the solution is refined time and again with the help of customer feedback (Cooper 2001, Wheelwright and Clark 1992). When new information or test results become available, the development team may need to repeat an activity and refine the design (Ulrich and Eppinger, 2012). Finally, commercialization phase should also be an iterative process, and the marketing planning should be refined as the innovation process advances (Cooper, 2001). After the first version of the product has been introduced to the market, the company should learn from it, improve the product and the marketing approach, and try again (Lynn, Morone and Paulson, 1996). While developing the second version of the new innovative product, the company might return to the activities of any phase in the process, and this way the innovation process becomes iterative as a whole.

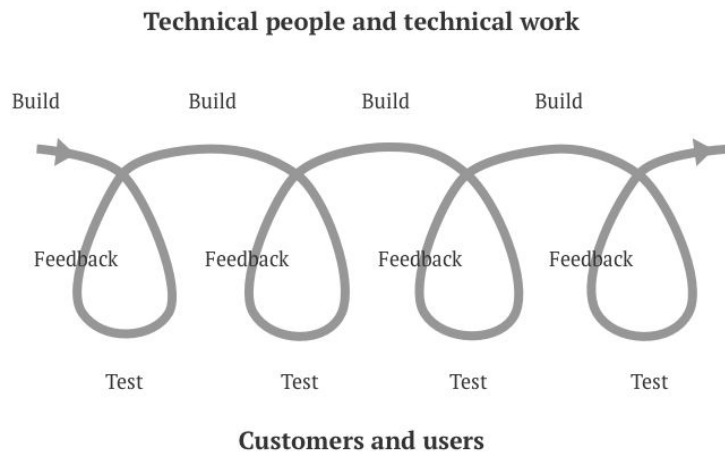


Figure 3. Iterative nature of the rapid-prototype-and-test pattern (adapted from Cooper 2001, p. 257).

An iterative or cyclical model is considered to be most adaptive in situations where the outcome of the project is yet unclear. Schoen, et.al. (2005) propose a high-level cyclical model of the whole innovation process, which considers the unpredictable nature of the process and the need for continuous development. When developing the product iteratively, the project is more adaptable to changes of requirements or occurring problems (Boehm, 1988).

The literature advocates the collaboration between the different business units during the whole innovation process. The new idea might arise from departments inside the company, like the research and development, sales, marketing or production, or from outside resources such as customers, research organisations or competitors (Cooper, 2001). Further, the development of the idea is enhanced through collaboration with cross-functional teams or direct contact with customers, users, and other companies (Koen, et.al. 2001). Ulrich and Eppinger (2012) say that not only the design team but also the other business functions across the company are responsible for the product development phase, including marketing, manufacturing, research, finance and management functions. Additionally, Simula (2012) highlights that commercialization should happen in parallel with the front end and product development phases, to support the success of the product.

2.1.2 Commercialization phase

There does not seem to exist one clear definition for commercialization of new products, and the terms commercialization and launch have been used quite liberally by scholars (Simula, 2012). Simula (2012) offers a definition for commercialization in the context of industrial B2B product innovations which is also the context of this thesis:

“Commercialization is a set of business activities, tasks, and actions that run in parallel with ideation and product development processes and complete

them so that a new product can become commercially viable, tradable, and eventually successful on the market” (Simula 2012, p. 111).

Simula’s (2012) conception of commercialization covers a wide time span in the innovation process meaning the commercialization should be an ongoing activity starting from the beginning of the innovation process. This view is supported by several scholars (e.g. Cooper, 2001; Crawford and Di Benedetto, 2003). Thus commercialization includes activities that could count as part of the other phases as well. The activities of commercialization prepare for the launch where the product is introduced to the market for the first time (Cooper, 2001). Defining an ending point for the commercialization is not worthwhile, because after the product is brought to the market, it is not exact at what point commercialization becomes marketing of the established product (Simula, 2012).

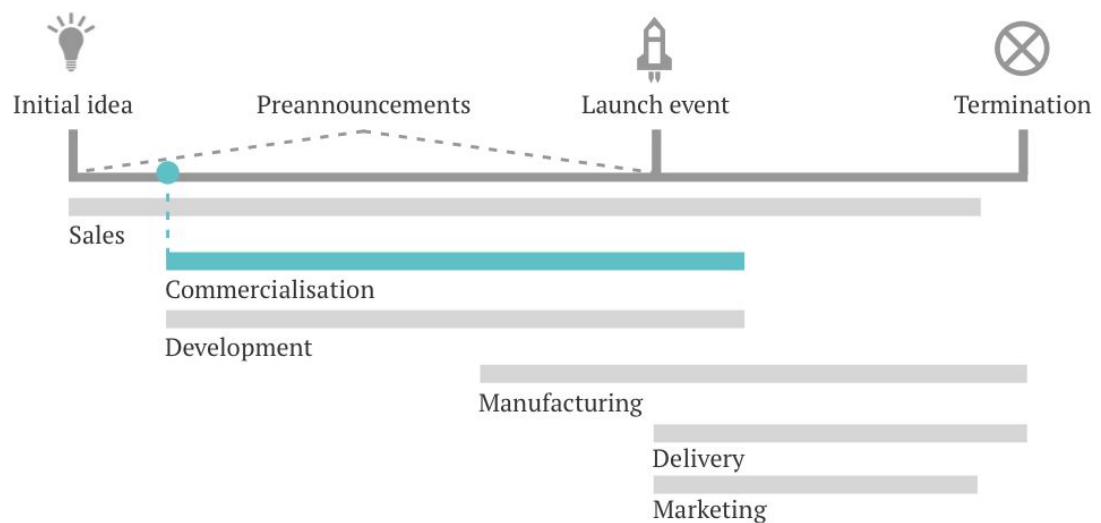


Figure 4. Commercialization roughly positioned on a timeline (adapted from Simula 2012, p. 116).

Launch is seen critical for the success of the product, and it needs to be prepared carefully. The company usually has only one chance to launch the product, and therefore it is critical to succeed in it (Beard and Easingwood, 1996). Launch is the final test to see whether the product answers to the needs of the market (ibid.). According to Crawford and Di Benedetto (2003) the company should make two sets of decisions in the commercialization of a new product. This includes strategic decisions, such as targeting and positioning, as well as tactical decisions such as communication, promotion, distribution and pricing to implement the strategy (Crawford and Di Benedetto, 2003). Soni and Cohen (2004) give a list of basic questions to be covered when planning for the launch:

- What are the launch goals and strategy?
- What are the requirements for launch success? (e.g. targets for sales to key customers, and overall revenue of the first year)
- Who are the major players and stakeholders? Does the launch team have the required cross-functional expertise?
- What are the key milestones for internal components (pricing, documentation, warranty, demos, sales tools, training for sales/channels/service/support)?
- What are the key milestones for external components (press and analyst meetings, advertising and marketing agency deliverables, trade show timing, etc.)?

Sometimes the developed technology can turn out not to fulfil the purpose it was developed for in the first place, or the technology can provide a base for another useful purpose. Parker and Mainelli (2001) argue that often the full potential of a technology is not captured with single project. The product might be successful in another product application. There are numerous examples where one technology has been commercialized for new purposes. A good example of this is the steam engine that was used both in ships and trains (Parker and Mainelli, 2001). This requires a new commercialization strategy, because the groundwork done in the phases preceding the commercialization might become outdated, and the understanding of the new market needs to be gathered.

The commercialization of technologies differentiates from the commercialization of products, as a technology offers a capability to be commercialized for multiple products (Jolly, 1997). In case of technology-push products, the process starts with an existing technology and finding a suitable market opportunity (Ulrich and Eppinger, 2012). According to Jolly (1997), the commercialization of a technology requires a range of activities, including the identification and evaluation of a suitable market opportunity for the technology, developing the product, preparing the market and sustaining it. Thus, technology commercialization expands to a longer period of time, and a wider set of activities, than the commercialization of products.

Commercialization is typically the most costly stage of the new product development process (Beard and Easingwood, 1996.). The stage often ends up being one of the most expensive because of the simultaneous investments required for both marketing and production, and it is often most poorly managed (Crawford and Di Benedetto, 2003). This does not hold good only for the commercialization of products, but also for technologies. Eldred and McGrath (1997) add that developing and utilising new technologies often requires more time and resources than what was initially estimated. The commercialization of technology-push innovations is considered especially risky and difficult, and to require more time compared to those of market-pull or incremental innovations (Dmitriev, et.al. 2014).

This thesis focuses in the commercialization of products in the context of B2B industrial companies. Specifically, commercialization is considered to extend over the whole innovation process, and to prepare the product to become successful in the market. Launch is considered as the single event where the product is introduced to the market, and being part of the commercialization phase.

2.2 Role of users and customers in innovation process

2.2.1 Defining terms user and customer

Terms user and customer are often used to mean the same subject. The term user is used in the literature of human-computer interaction (e.g. International Organization for Standardization, 2009; Huotari, et.al 2003) and ergonomics (e.g. Stanton and Young, 1999), while the term customer dominates the discussion in the field of management literature (e.g. Cooper, 2001; Ulrich and Eppinger, 2012).

The key difference in the use of these terms lies in what is aimed to achieve with studying the user or customer. Term user is used in the human-centered design, that “aims to make systems usable and useful by focusing on the users, their needs and requirements, and by applying human factors/ergonomics, and usability knowledge and techniques” (International Organization for Standardization, 2009). The focus is in individual human beings and in the context of using the system. The customer is the one who benefits from buying the product, and the research focuses on understanding the customer needs and recognising new business opportunities (Cooper, 2001). A customer need becomes a business opportunity, if the need is shared among a larger scale of customers. A customer can be an individual or a company. If it’s an individual, also the term consumer is used (Hippel, 2004). In case the customer is a paying company, also the terms client and company are used.

Lead user is a term introduced by von Hippel (1986) for special types of users that occur often in the innovation management literature. Von Hippel (1986) explains they are “users whose present strong needs will become general in a marketplace months or years in the future”. The lead users have often created their own solutions to their needs. Thus they represent valuable information of future needs as well as design and concept ideas. (von Hippel, 1986.) These lead users have very specific and niche needs, and will not necessarily represent the need of an average user (Ulwick, 2002).

In this literature review, both terms user and customer are used, and the selection of the term depends on the literature field being discussed.

2.2.2 User and customer interaction has a positive impact in product success

Research has widely agreed that interacting with customers during the new innovation process has a great positive impact on the product success (e.g. Cooper, 2001; Gruner and Homburg, 2000; Maidique and Zirger 1986). Through customer interaction the company becomes aware of the customers’ problems and needs, and

can recognise new opportunities (Cooper, 2001). Listening to the customers is a key activity in making sure there is a market for the product (Ogawa and Piller, 2006). If customer needs are not discovered or the needs are misunderstood, the product might fail and have a low financial performance.

The input the company should expect from users and customers is their needs as outcomes, and not solutions. The customers should not be expected to present technically viable solutions that could be directly put into production and launched. Turning the customer understanding into viable solutions requires the skills and expertise of the company (Gruner and Homburg, 2000). The company is usually the one to possess the specialised knowledge in its own field, while the customers possess the detailed knowledge of their own context of use (von Hippel, 2004). The best input the customers can provide is the outcomes they want to achieve with the new product (Ulwick, 2002). For example, if customers say they want an online grocery store, their real need could be doing faster groceries. The most viable solution to this need could also be a mobile online shop, self-service cashier, or home delivery.

The literature has varied conceptions on which are the most important phases of the innovation process to interact with users and customers. The literature that recognises the importance of user and customer interaction for the product success, tends to focus on the front end and product development phases (e.g. Hanington 2003; Koskinen 2003; van Kleef, et.al, 2005). The value of customer interaction during commercialization and post-launch phases has not been given as much attention in the literature (Hoyer, et.al 2010).

Gruner and Homburg (2000) present a comprehensive qualitative study on the effect of customer interaction for the product success in different stages of new product development process. They divide the innovation process into six stages. Figure 5 illustrates how these stages correspond to Koen's (2001) three-phase model of an innovation process, and what kind of impact they found customer interaction to have in each phase.

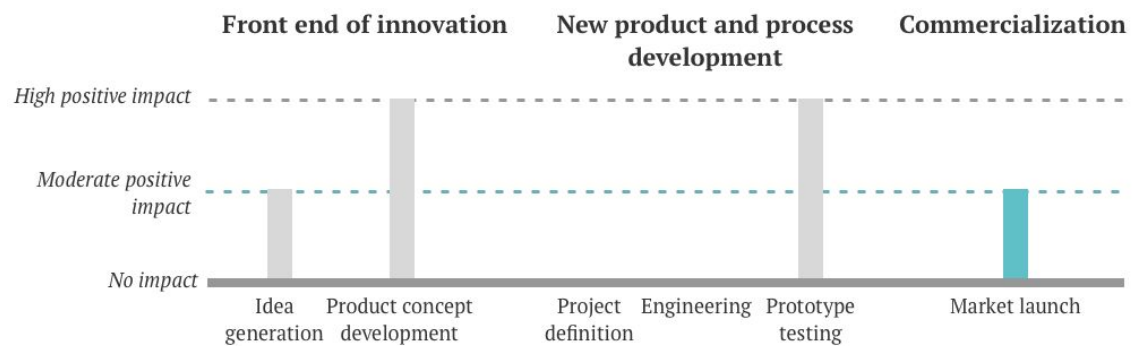


Figure 5. Six stages examined in Gruner and Homburg's study (2000) in relation to Koen's (2001) model of three phases of innovation process.

Gruner and Homburg (2000) noticed customer interaction to have a positive impact in the idea generation and product concept development phases. During the idea generation and product concept development stages customers have an important role, since the target market and the customer needs will be identified (Ulrich and Eppinger, 2012). Many studies support this finding that interacting with customers is especially important in the concept development phase (e.g. Wheelwright and Clark, 1992). Wheelwright and Clark (1992) remind that choosing the right customer is critical, because the customer will affect the direction of the development, and the collaboration can strengthen or hurt the relationship between the customer and the company. Gruner and Homburg (2000) state that at the first two phases of product development - project definition and engineering - the customer interaction has no impact on product success. Then again, the final part of the product development phase - prototype testing - benefits greatly from the customer interaction, because at this stage doing modifications to the product is still possible (Gruner and Homburg, 2000).

According to Gruner and Homburg's study (2000), market launch does not benefit as greatly from customer interaction as the previous phases. Their reasoning is that at this stage the product cannot be changed anymore, and the effect is limited to product positioning and using the customers as a reference (Gruner and Homburg, 2000). The positioning of the product in the market requires market knowledge that is acquired already at an early stage of the innovation process (Cooper, 2001). New customer understanding might lead to repositioning of the product, if a new market potential for the technology is recognized (Parker and Mainelli, 2001). Customer references are important for demonstrating the value and functionality of the product, as well as the performance and experience of the company (Jalkala, 2009).

However, the benefit of user and customer interaction in commercialization should not be limited to the two benefits of product positioning and using customers as a reference, because a lot more benefits have been recognised in other literature. For one thing, Hoyer et.al (2010) summarise that interacting with customers by giving

information about the new product to a community creates awareness, and can save the company with other advertisement expenses.

Furthermore, customers using trials or the first product release should be actively asked for feedback, so the company can react early and fix the potential issues before them becoming major ones (Hoyer, et.al, 2010). Jespersen (2010) proves that integrating pioneering users in the launch phase of a new product development process provides the development team with insightful feedback on how they think the product works. Pioneering users are interested in trying out the new product or prototypes of it, and at the same time the pioneering users get to know the product before it is brought to the public (Jespersen, 2010). Also in the consumer markets, customers can provide the company with open and honest feedback on the product, and ideas for future development. Consumers provide the company with knowledge and skills they possess, willingness to experiment, and ability to engage in active discussion (Prahalad and Ramaswamy, 2010).

In a case referenced by Maidique and Zirger (1986) new end user research in commercialization phase would have been vital to foresee the changed conditions of the market. In this case, a startup computer systems manufacturer failed to recognise that by the time of the launch the customers had become significantly more sophisticated and were developing their own specialized software. Thus the original user needs had become obsolete, but the company learned this only through low revenues after three years in the market. (Maidique and Zirger, 1986.)

Larson and Resney (2004) define customer understanding as one of the core factors in increasing the revenues. This requires the company to monitor the customer behaviour, and frequency of buying, to understand how customers make their purchase decisions, who is involved, and what kinds of things matter. This enables the company to determine tactics how to make them buy more often and pay more. (Larson and Resney, 2004.) Actively monitoring the customer feedback can also help the company to understand issues in repeat purchase, and ways to increase the level of the repurchase (Hoyer, et.al, 2010).

Ogawa and Piller (2006) introduce a process called collective customer commitment, where company ensures a sufficient demand for the product before it invests in the final development and manufacturing by asking for commitments from customers to purchase the product. The collective customer commitment naturally works only for certain types of products. The customer needs to be confident about using the product, and to know what kind of value the product will bring. In case of new and highly radical products, the customers might be more reluctant to make investments before understanding its value.

The benefits discussed above is not a comprehensive answer to the benefits the user and customer interaction can have for commercialization. The topic of customer and user interaction has not been extensively studied in literature, and further benefits could be recognised. The empirical research (chapters 3–5) of this thesis

complements to the list of benefits recognised in the literature, and demonstrates the benefits perceived by the companies studied in this thesis.

2.3 Approaches for studying users and customers

Studying users and customers can be done in countless different ways, and there are no rigid guidelines how to use them. The literature gives a lot of examples of different kinds of approaches, and how these approaches have been used and modified. Due to the plethora of approaches and their modifications, choosing the right approach for a new case to be studied can be challenging. The researcher needs to consider which method best serves the goals of the project at a given time of the process (Hanington, 2003).

In order to understand the whole spectrum of the approaches for user and customer research, the approaches used during the whole innovation process should be considered. As discussed in the previous chapter, user and customer research methods are most strongly present in the front end of innovation (Huotari, 2003). Out of the three phases of innovation process, commercialization is traditionally the phase with least amount of end user and customer studies. commercialization rather relies on the knowledge acquired in the preceding phases, market studies, and on the responses from the market after launch (Beard and Easingwood, 1996; Cooper, 2001).

The following chapters discuss the differences of the approaches, and concludes with recommendations for suitable approaches to be used in commercialization.

2.3.1 Classification of approaches to study users and customers

The approaches for studying users and customers are often classified according to the type of knowledge they produce. Visser et.al. (2005) arrange the research techniques according to the depth of the knowledge they produce, varying from a surface level to a deep level of knowledge. Their model is an extension of Sanders and Dandavate's (1999) analysis which concluded, the researcher can find out knowledge on three levels: what users say, do and make. The first level of say represents the surface level of knowledge, and the third level of make represents the deep level of knowledge (Visser, et.al. 2005).

Similarly to the model of Visser et.al. (2005), Hanington's (2003) classification arranges the approaches according to the type of knowledge they produce. Instead of evaluating the depth of knowledge, Hanington (2003) demonstrates through examples what kind of knowledge the approaches lead to. The most superficial knowledge is numerical, verbal and generalisable, while the most profound level of knowledge is visual, verbal and analytical (Hanington, 2003).

Hanington (2003) divides the research approaches into three categories which are similar to the categories of say, do and make from Sanders and Dandavate (1999). These three categories are traditional, adapted and innovative (Hanington, 2003).

Figure 6 brings these two models together illustrating the similarities and how they complement each other.

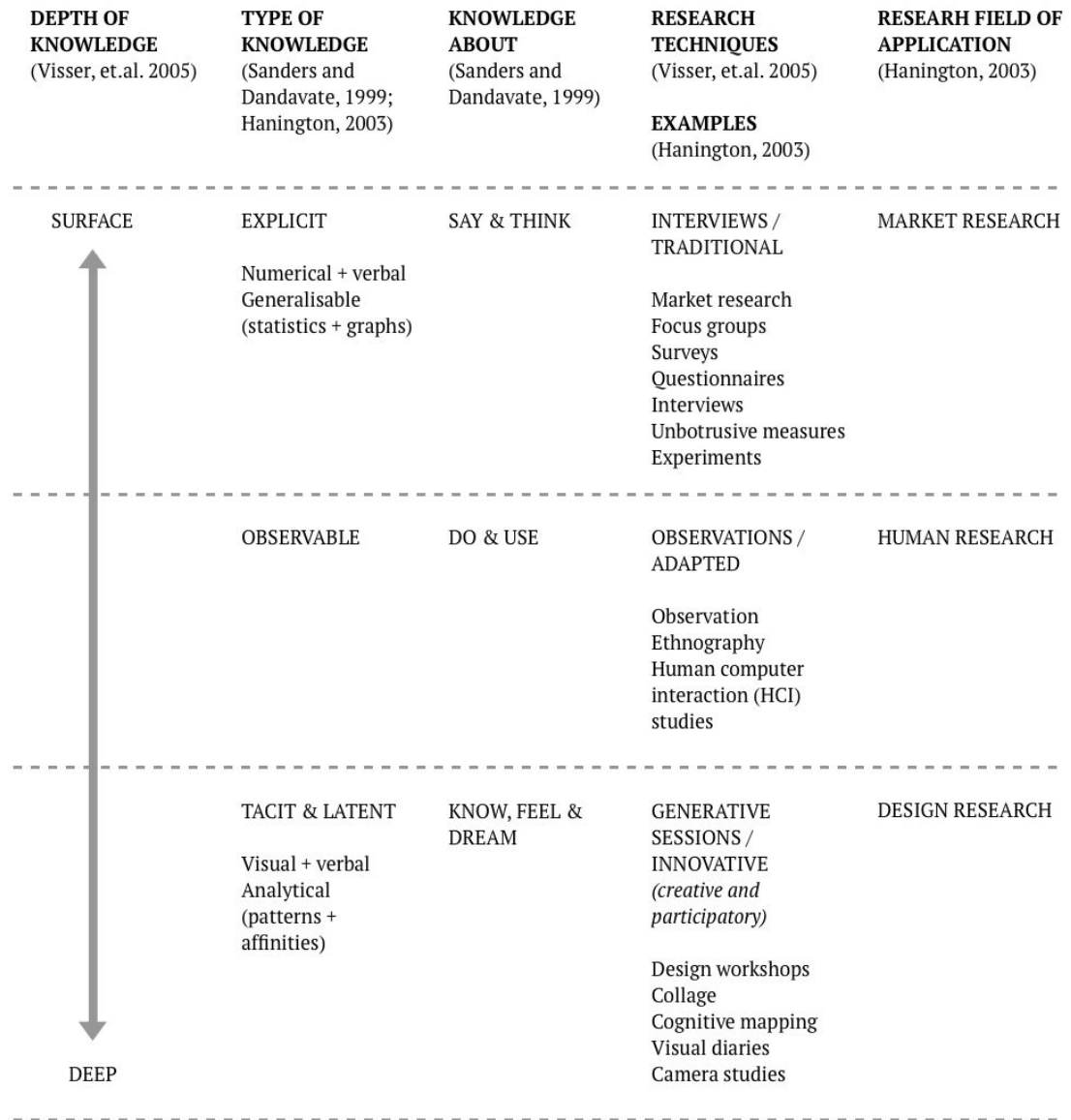


Figure 6. Adaptation of the models of Visser, et.al. (2005) and Hanington (2003) on the classification of user and customer research approaches.

The first and most superficial level of knowledge is reached through interviewing techniques that focus on what people say and think (Visser, et.al. 2005). They produce explicit knowledge, since they focus on what the users can and want to express in words (Sanders and Dandavate, 1999). These techniques are equivalent to the category of traditional methods in Hanington's (2003) model, that produce numerical, verbal and generalisable information. These include methods like focus

groups, surveys, questionnaires and interviews (Hanington, 2003). These methods are most traditionally used in market research (Sanders and Dandavate, 1999).

The second level of depth is represented by observational methods that focus on what people do and what they use (Visser, et.al 2005). To the same level with observational methods, Hanington (2003) adds the ethnographic research methods, and the methods of usability inspections of human-computer interaction, to give examples of research done in real-life contexts and artificial laboratory contexts. In research with these adapted methods, the user is not as capable to control the information he wants to deliver to the researcher in a similar way as with the interviewing methods. Through these methods it is possible to reach a deeper understanding of the subject, especially if the use and behaviour happens in a real life context instead of a laboratory. Sanders and Dandavate (1999) say these methods are traditionally used in the design research. In Hanington's (2003) opinion these methods are used traditionally in human research, and need special adaptation to support the purposes and goals of design.

On the third and deepest level lies the tacit knowledge which answers to what people feel, know, and dream (Visser, et.al 2005). This information is hard and sometimes even impossible to express in words. Understanding the feelings enables the researcher to empathize with the user, and the dreams can expose latent needs (Sanders and Dandavate, 1999). To reach this level of knowledge, the researcher may utilise generative sessions that "produce varied and rich views, anecdotes, and explanations about the explored context which include the use situation and the users' concerns, memories, feelings, and experiences surrounding it" (Visser, et.al 2005). Hanington (2003) also discusses about these participatory and creative methods and calls them innovative methods due to their newness. Sanders and Dandavate (1999) continue that these generative methods are the most new and innovative for design research. These methods include for example design workshops, collages, and camera studies (Hanington, 2003).



Figure 7. Examples of generative techniques (Visser, et.al. 2005).

The fundamental difference between traditional market research and design research is in the viewpoint from which the end users and customers are being studied, and what kind of understanding they try to achieve. The aim of market

research is to recognise emerging needs in the market (Cooper, 2001), while design research aims at understanding the latent and future needs (Sanders and Dandavate, 1999). Traditional market research methods, including surveys, interviews, questionnaires, and focus groups, lead to generalised results of a large group of users (Hanington, 2003). In contrast, the participatory and creative design research methods are used with individual users, to engage them, help them to express their feelings, and to create an empathic understanding (ibid.).

The classification of the methods (figure 6) shows that it is important to evaluate what kind of information is needed, when choosing the right method. The figure is not a comprehensive list of all kinds of methods, but helps to understand the dimensions of the knowledge they produce. Additionally it helps to classify other methods not discussed here, and to predict what kind of knowledge they could produce.

2.3.2 Choosing applicable approaches

The previous chapter showed the great variety of methods to do user and customer research. Selecting the right methods from the plethora of the methods can be challenging. Literature gives some guidelines on how to choose the most applicable methods. As the first guideline, to gain a complete empathic understanding of the subject, methods evoking knowledge about all three categories should be included: what people say and think, what they do and use, and what they know, feel and dream (Sanders & Dandavate 1999). Hyysalo (2009) supports the notion, that the best solution is to use various methods mixed. Particularly, it is often necessary to complete and validate the findings of a user research with wider surveys (Hyysalo, 2009).

Hyysalo (2009, p. 209-213) lists three most important questions in planning the user research: 1) what information is needed (for the project and the whole company), 2) which resources are available (know-how, tools, time and money) and 3) which methods and capabilities can be applied or created. Further, Hyysalo (2009) recommends to consider, what is the maturity of the technology, and how similar the new users are from the current users. To help choosing a suitable method, Hyysalo (2009) classifies the research methods in a figure that considers these two aspects (see figure 8).

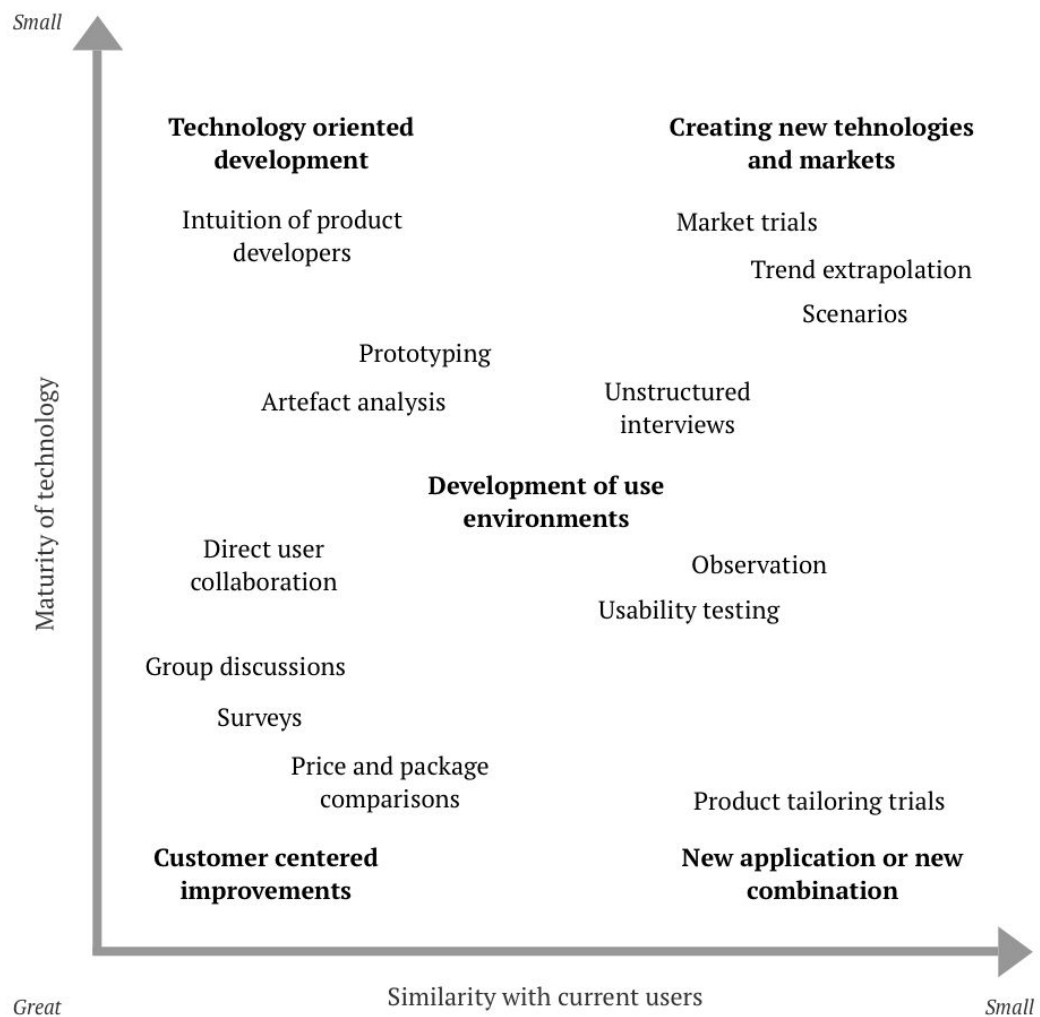


Figure 8. Classification of user research methods according to the maturity of technology and similarity of current users (adapted from Hyysalo, 2009).

Hyysalo's (2009) classification indicates, that in case the technology is mature, and the users stay the same, the traditional market research methods are the most applicable to define how to refine the product (bottom left corner in figure 8). The newer the users are, the harder it is to know what kind of information is needed. That is when the project benefits from methods that are less structured and more open for new and surprising knowledge, including observations, and unstructured interviews (middle of figure 8). When the users are totally new, Hyysalo (2009) suggests using scenarios and trend extrapolation, and doing trials of products to show their potential success (rightmost side in figure 8). Yet, these methods contain limited amount of interaction with users. Hyysalo's (2009) publication focuses on the user research methods, and therefore the analysis does not elaborate on the other types of research methods. The creative and participatory methods, which comprise the third category of methods in Hanington's (2003) model, could

complement Hyysalo's model in situations where the users are yet little known (rightmost side of figure 8).

2.3.3 Traditional market research and its criticism

In commercialization, information about users and customers is needed for prepare the market planning. Market planning includes defining the target market, product strategy and launch plan (Cooper 2001, p. 287–309). The information needed for the market planning is usually gathered as part of the market study, which is needed to refine product idea into a proper product description, to evaluate what is the unique benefit and value of the product to the customer, and what are the design requirements to achieve this (Cooper, 2001).

The market study is traditionally done using market research methods. A good illustration of a traditional market research method is the voice-of-customer research introduced by Cooper (2001, p. 162–165). Voice-of-customer is not a set methodology but gives examples how to interact with the customer to discover new market opportunities. The voice-of-customer consists of three types of research approaches:

- 1) Visiting and doing interviews at the customer's premises, which is a light anthropological research approach
- 2) Product Value Analysis, where facets of the product are given to customers to express their views, difficulties and concerns
- 3) Conducting customer surveys or focus groups, and to have a group of experts to analyse them into viable solutions

Suni and Cohen (2004) suggest also indirect channels for gathering customer knowledge. These include customer initiated feedback, e.g. through customer call center and warranty claims, as well as feedback through sales people (Suni and Cohen, 2004). Comparing these to the classification of user research methods of Visser, et.al. (2005), these channels represent the first level of understanding what people say (see figure 6).

Investing heavily in traditional market research has not preserved companies from failures of newly launched products, and many products have failed simply because they have no market (Ogawa and Piller, 2006). The following list demonstrates reasons why traditional market research can lead to failures in understanding the customer needs.

- 1) *Poor representation of a great number of people.* Especially in focus group studies, the limited number of participants is not a reliable indicator to represent the needs of a broader population (Ogawa & Piller, 2006). Ulwick (2002) adds to the discussion by relating to the lead user methodology, where advanced and experienced users with special needs are selected to innovate for new solutions. This group is narrow, and they do not represent the

average user. Thus their recommendations can produce a limited appeal when the solution is introduced to the public. (Ulwick, 2002.)

- 2) *Users have limited knowledge.* In focus groups the customers are often given only verbal or other limited description of the product. The customers might underestimate benefits the new product could offer them, if they fail to imagine the final product. (Ogawa & Piller, 2006.) Additionally, users can imagine the benefits of a product in the limits of their own context. Further, the customers are not aware of all the possibilities the new technology could offer, and therefore cannot be asked for detailed needs. (Leonard-Barton and Doyle, 1996.)
- 3) *Limited representation of the real-life context.* Focus groups, usability studies and other traditional market studies are run in laboratories and other artificial contexts, but empathic design goes to the customer's own environment to observe their normal and everyday routines (Leonard and Rayport 1997).
- 4) *Poor evaluation of real purchase behaviour.* Conventional market research methods inform the researcher about attitudes and intentions to buy the product, but they do not provide estimates of real sales numbers (Ogawa and Piller, 2006). Even describing the purchase intentions is limited, since decision making involves only little of rationality, and mostly it stems from habits, emotions, and the influence of social and physical context (Zaltman, 2003). Thus conventional market research methods are not enough to study purchasing behaviour, since they do not disclose the unconscious thinking and emotions.

Ogawa and Piller (2006) suggest test marketing to estimate the purchasing behaviour, but it is timely and expensive. Beard and Easingwood (1996) remind that the final demand for the product will be measured, when the product is launched to the market. If evaluating the purchase behaviour is necessary, it is better to use the methods specialised for that instead of using market research methods like focus groups that are capable of involving only limited amount of customers in the research.

- 5) *Listening too intensively to the current market.* Listening too intensively the needs and trends of the current market can make the company blind, and the company becomes unable to imagine how their product could affect those trends and needs of the market (Leonard-Barton and Doyle, 1996).
- 6) *Little information about the future.* Wheelwright and Clark (1996) state the marketers doing research in the early stage of the development, need skills to understand the desired experience of the future customers, because the insights of the customers needs to go beyond defining product specifications (Wheelwright and Clark 1996, p. 171). Visser et.al. (2005) add that the

conventional methods are restricted to examine the current and past experiences of people, and little about the future. To design for future experiences, the researcher needs to get a grasp on people's dreams, fears, ideas and aspirations (Visser, et.al. 2005).

- 7) *Emotions and thoughts are not discovered.* Unlike market researchers assume, customers are not capable of inspecting and articulating their emotions and thinking, because they happen unconsciously (Zaltman, 2003). To evoke the emotions and thoughts, it should be understood that most thinking is visual based, most communication is nonverbal, and understanding new things happens through metaphors (Zaltman, 1997). Methods that are creative and participatory are best in probing thoughts and emotions (Hanington, 2003).
- 8) *Neglecting the desired experience of an individual customer.* Above traditional products and services that serve the needs of mass markets, customers desire memorable experiences. These experiences are personal, and come to exist in the interaction between the individual and the offering. (Pine and Gilmore, 1998.) Thus the generalised information derived from traditional market research methods is not enough to understand the desired experiences of individual customers.

Slater and Narver (1998) argue that the criticism for market orientation is due to the misconception of mixing market orientation with customer orientation. Customer oriented businesses utilise traditional market research methods like surveys, focus groups, and concept testing. Customer oriented businesses are reactive in nature, and focus on satisfying the short-term needs of the current customers. Market oriented businesses utilise methods like observation of customers using the products in their daily activities, lead user methodology, or probe and learn process. Market oriented businesses have a long-term focus, are proactive by nature, and aim at understanding both expressed and latent needs. (Slater and Narver, 1998.)

The argumentation of Slater and Narver (1998) highlights the importance to focus on the future and the customers' latent needs that are impossible to discover with traditional market research methods. Nevertheless the tools they offer for discovering the future and customers' latent needs stays minimal. Learning about future experiences and latent needs requires creative and participatory methods (Hanington, 2003). Therefore the next chapter discusses more thoroughly how these empathic design research methods could complement the shortcomings of the methods used in market research.

2.3.4 Empathic design research complementing market research

Studying the desired experiences of future customers often includes aspects that are not easy to articulate or even to recognise (Wheelwright and Clark, 1992). Users are rarely aware of their psychological responses to product details, and they cannot articulate their desires on things that do not yet exist (Leonard-Barton and Doyle, 1996). Traditional market research methods used in commercialization are not

enough to design for future experiences (Visser, et.al. 2005; Zaltman, 1997). The researcher needs to become aware of the emotions and dreams, that cannot be expressed in words (Sanders and Dandavate, 1999). These aspects are best evoked through methods, that are creative and participatory (Hanington, 2003).

To learn from the feelings and thoughts, the researcher should interpret the users' expressions with empathy (Fulton Suri, 2003). Mattelmäki (2006, p. 34) describes design empathy as "the ability to put oneself in someone else's position, to imagine oneself in someone else's place." Mattelmäki and Battarbee (2002) add that empathy is essential when trying to understand the personal experiences and the private contexts of the users. This requires that users are not seen as test subjects but as humans that have feelings. To reach this empathic understanding, the designer should establish personal contact and connection with them. (Mattelmäki and Battarbee, 2002.)

As defined by Koskinen (2003) empathic design methods are:

- *"User-centered* in that they require contact with real users.
- *Visual and tactile*, providing designers with inspiration, not just data.
- *Deliberately cheap and "low tech"* and, as such, easy to adopt in the real world where money is scarce.
- *Interpretive*: to be able to design effectively designers need to understand how people understand themselves.
- *Playful and fun*. When exploring new ideas, users are almost invariably asked to imagine and dream in a future world created by designers. To be rewarding such exercises must be fun.
- *Tested in reality*. We report cases from real product and concept development because we believe that this is the best way to make sure the methods we propose work where they should: at the front line of imagination in the corporate reality.
- *Targeted at the fuzzy front end*, as Jonathan Cagan and Craig Vogel from Carnegie Mellon University have recently (2001) called the early phases of product development."

(Koskinen 2003, p. 7.)

According to Koskinen's (2003) principles, empathic design methods are rather light and cheap to implement, so that they would have a low threshold to be applied in a real-life context. In contrast, Cooper (2001) outlines the voice-of-customer research is burdensome and requires extraordinary insight. Thus it is important to notice, that not all user research needs to be laborious and expensive to implement, and

even low-tech methods can provide the researcher with valuable insights to the subject.

Koskinen and Battarbee (2003) have studied using empathic design methods in the fuzzy front end of innovation, and more specifically in the concept search phase preceding the concept development. Less studies have been made on the potential benefits of empathic understanding for the activities in commercialization, including the decisions on how to communicate the product to the market. On a general level, usefulness of understanding emotions and ability to empathize in have been discussed in the marketing and sales literature.

In marketing and advertising of consumer goods emotions have been recognized as one of the key influencers on purchase decision (e.g. Bagozzi, Gopinath and Nyer, 1999; Laros and Steenkamp, 2004). The purchase decisions of consumers are highly affected by emotions and only little by rational thinking (Zaltman, 2003). Emotions affect how the customer processes information, and how they respond to stimuli (Bagozzi, Gopinath and Nyer, 1999). On a good mood, we are more likely to buy gifts to delight our friends than on a bad day. Thus emotions the product or advertisement possibly evokes in consumers should be carefully studied and designed for. Having the ability to design a marketing message that evokes the desired emotions requires skills to understand the feelings and thoughts of the customer.

The influence of emotions on purchase decision applies not only to consumer business, but also in business to business markets. In all kinds of sales activities, it is essential to empathize with the customer's situation to be able to successfully identify the customer's needs and fulfil them (Von Bergen and Shealey, 1982). Salespeople who are capable of recognising and responding to the emotions of the customer and their own, are better at generating more revenue but also at retaining the future business with the customer (Kidwell et.al. 2011).

McBane (1995) reminds that salespeople's ability to empathize with customers can have both positive and negative affect, and a successful salesperson is not overly sensitive and emotional. He studied three dimensions of empathy in sales activities: perspective taking (being able to put oneself in another's situation), empathic concern (feeling concerned about the welfare of others), and emotional contagion (experiencing the observed emotions, e.g. joy or suffer of another person). Of these three dimensions perspective taking has the only positive effect on sales performance, if the salesperson is capable of directing the interaction in a desired direction - towards a sale. (McBane, 1995.) When planning the sales strategy in the commercialization phase, it could already benefit the salespeople to enlighten themselves on the potential emotions of the customers, and become better prepared to act on them and to evoke the desired emotions.

Based on the discussion, three potential benefits of conducting empathic design studies in commercialization to understand customer's potential emotions are

recognised: 1) form the right marketing message to evoke desired emotions, 2) retaining the future business and affirming customer relationship, and 3) help the salespeople to foresee the customer's individual situation and needs, and potentially to prepare acting on them and evoking the desired emotions. Further possible benefits of empathic understanding in commercialization will be explored in the empirical studies, in chapters 3, 4 and 5.

2.4 Conclusion

This literature research discussed the user and customer research in commercialization, what is the perceived value of user and customer interaction for the product success, and how is the research conducted. The value of user and customer interaction in the innovation process is undeniable. Every successful product needs user and customer research to make sure there is a need in the market. The benefits of conducting user and customer research during innovation process was presented in chapter 2.2.2.

User and customer interaction is most embraced in the front end of innovation, and in the product and prototype testing, but less in the third phase of commercialization. In commercialization user and customer studies are often done as part of the market planning that should start already in the beginning of the process at the same time of the initial concept planning. The research done in the market planning usually uses traditional market research methods. Market research methods lead to numerical and statistical findings, which can be insufficient for understanding the needs comprehensively, and to design for future experiences.

To understand user and customer needs comprehensively, it is recommended to use a varied set of methods. Including methods that reveal things what people say and do, as well as feel and dream are needed. This requires observational, creative and participatory methods in addition to the traditional methods. The observational methods are most used in human research, whereas the creative and participatory methods are most used in design research. Using a varied set of methods creates and empathic understanding of the user.

In commercialization and even after the product launch, it can be beneficial to conduct user and customer research that reasserts the empathic understanding of users and customers. It could help the sales and marketing to prepare for the emotions of the customer, to better respond to them, and to form a marketing message that evokes the desired emotions. The benefit of using creative and participatory research methods in commercialization, and aiming for an empathic understanding, is further studied in the empirical research of this thesis.

3 BENCHMARK COMPANY STUDIES

This chapter first describes the selection of the three benchmark companies, and the methodology for conducting the interviews. The findings at each company will be presented, and analysed in the context of this research. Finally the answers to the research questions will be drawn together.

3.1 Methodology

The interviews at the benchmark companies were done in order to gain understanding of their activities and processes for capturing user and customer understanding. The focus of these interviews was to gain an impression of how the company representatives talk about their users and customers, and how they study and interact with them. In particular, it was asked whether the interviewees make a difference between the terms of user and customer, and what other terms they use when talking about them. More detailed interview structure is presented in the appendix A1. The findings were used to compare the situation of the focal company A, and to get recommendations for doing user research in the Digital Wallcovering case.

Given that the focal Company A represents a globally operating industrial company, also the benchmarking companies were chosen amongst industrial companies, all of which were operating in both domestic and foreign markets. The first benchmark company interviewed (Company B1) operates solely in the B2B market, producing high-technology equipment for other industrial companies. The design of their products require careful consideration of safety, usability, and efficiency, since their products are used by the end users on a daily basis.

The second benchmark company (Company B2) serves both B2B and B2C markets. For the B2B market the company produces high-quality raw materials and products that are used by construction companies. For the consumer market, the company produces finalised products for buildings. Thus they need to deliver reliable and long-lasting solutions. The third one of the benchmark companies (Company B3) produces finalised construction materials that are delivered to consumers through retailers, and to professionals with direct sales. These materials are mass-produced, and require yearly updates to follow the upcoming consumer trends. Despite the trend reliance, their products need to be long-lasting and to endure changeable conditions.

The roles of the interviewees in the interviews done at the focal Company A were wanted to be heard also in the interviews at the benchmark companies. Therefore the interviewees were selected from the departments of innovation management, research and development, and sales and marketing. Altogether six interviews at three benchmark companies were conducted - two at each. Two interviewees were working in innovation management, one in research and development, one in sales, and two in marketing. In order to validate the findings gained from the benchmark company interviews, one senior post doctoral researcher from the field of design and HCI was interviewed.

Table 5: Interviews done at the three benchmark companies.

	Market area	Location of operations	B2B market	B2C market	Interviewees
Company B1	global markets	global departments	Finalised products to business customers	-	Iv_B1_1: Usability Engineer (R&D) Iv_B1_2: Industrial Designer (Innovations)
Company B2	European markets	global departments	Finalised products and materials for business customers	Finalised products directly to consumers	Iv_B2_1: Business Director (Sales) Iv_B2_2: Development Manager (Marketing & Innovations)
Company B3	European markets	domestic departments	Finalised materials for business customers	Finalised materials to consumers through retailer	Iv_B3_1: Director of Innovations (Innovations) Iv_B3_2: Head of Marketing (Marketing)

3.2 Results

The findings from each benchmark company are compared in this chapter and summarised to give answers the research questions of this thesis. The topics that these interviews build up to, included the roles of users and customers in the organization (chapter 3.2.1), value of user and customer interaction in innovation process (chapter 3.2.2), the approaches to study users and customers (chapter 3.2.3), and finally recommendations for conducting user and customer research (chapter 3.2.4).

3.2.1 Roles of users and customers in innovation process

The interviewees were asked to clarify who they mean when talking about users and customers, because this reveals what kinds of different roles they are given in the company. The interviewees gave varied definitions to the terms user and customer

depending on the company they represented, and their position in the company. The people working on developing new product innovations saw a clear difference between the terms of user and customer. These were the people from innovation management and product development departments. On the opposite, the people working with existing products, the ones from sales and marketing departments, did not find it relevant to talk separately about users and customers. This might be due to the fact, that in new product development, the focus is in designing for usable and desirable product, and therefore it is more natural to talk about the user. In sales, the focus is in buying and defining the value of the product, and it makes sense to talk about a paying customer. None of the benchmark companies considered a business partner as a user, but always related to an individual person.

At the benchmark company B1 the interviewees saw a clear difference between the terms user and customer. The customer of the company B1 was the one to make the purchase decision of a new product. These customers were met in sales meetings. The user was the one using the final product, the equipment, in their daily work. These users were met at the user's workplace, when customising, installing and maintaining the equipment, as well as doing field research. The interviewees considered it self-evident who is meant by user and customer, when discussing about these inside the whole company.

In the benchmark companies B2 and B3 the difference between the terms user and customer was not as evident, as in the company B1. The interviewees of the company B2 did not use the term user in their business at all, only the term customer. In practice, a customer could be a retailer, sales person at the retailer, a construction company, or the individual consumer. But when the interviewees were asked, if the term user could be used to talk about some actor, they named the final consumer. The consumer was the one to pay for the product, and to use the product in their own house. In reality the terms user, customer and consumer were all used mixed to talk about the same actor.

"The user is the one who owns the product right, he is our customer. We need to understand what the users - damn how silly term in this business - what the consumer prefers."

(Benchmark company B2, Sales department, Iv_B2_1)

The company B3 found it important to define who they are talking about when talking about their customers: retailer or the consumer, or some other customer. The company B3 did not have a direct contact to the consumer, because they made all the consumer sales through retailers. Therefore the company B3 needed to do a lot of work through the retailer: convince the retailer to take the product in their store, to exhibit the products attractively, and help the retailer to attract consumers to the store. When talking about a user, the interviewees always meant the consumer. The other big customers the company B3 had were the professionals of construction

business. When talking about these, the company B3 would use the terms customer or professional.

Mixing the terms user and customer is prone to misunderstandings in discussions. For example if the sales department only uses the term customer to talk about everyone, it can mean a more limited group to the R&D department, who usually talks about users and customers separately. If the discussion clearly changes from people using the product to people paying for the product, it is more natural to first talk about users and later about customers. It can even be beneficial to change the term to redirect the focus of the discussion. Nevertheless, all the departments should share the same definition of the terms user and customer of the product, to keep the discussion unambiguous.

3.2.2 Value of user and customer interaction in innovation process

The focus here was to study how the companies valued the understanding the individual users and customers, but more general knowledge, like market trends and sales statistics, was given less attention. The benchmark companies found it useful for their business in general to interact with users and customers during the innovation process. This worked both as a tool for capturing user and customer understanding, but also as a way of creating closer relationships with the customers, and promoting their products.

“In the industrial side, in business to business, we wouldn’t do anything if we didn’t have user understanding.”

(Benchmark company B3, Innovation management, Iv_B3_1)

In Company B1 user knowledge was seen crucial for the development of their products. Without knowing the end users of their products and the context of use, the people developing the new products would need to make guesses. By knowing the users, they could be sure that the product fits to the need, and to the context of use. Otherwise the validation would base on sales numbers. Knowing the users well was also educating and the product designers and engineers became specialists - this way they could foresee pitfalls before making mistakes in the design. Understanding how the product fits to the whole context of use at the user site was found important, and to enable improving the product. Additionally the user understanding was seen crucial for arguing for the product benefits to the customer in sales meetings.

“We had not done user research, and had the final product already in pilot testing. We were about to go to the field to ask for product arguments for selling the product. There we found out that the product was awful to use, they were horrified how dangerous it was.”

(Benchmark company B1, Development department, Iv_B1_1)

In Company B2 the benefit of user knowledge was seen important in the sales discussions, when the salesperson needed to choose which product should be

recommended to the customer. When the salesperson has knowledge about the possible customer profiles, he might be able to analyse the situation better. The company B2 had systematically collected information about different sales situations to a database to share the knowledge to the other salespeople to prepare for sales meetings. This information included aspects like what happens in the meeting, what the customer asks, what is discussed about, how the customer reacts to the offer, and how to finally get the customer to sign the contract. Customer feedback gathered with an online form was useful for directing the marketing channels. They also believed that increased user understanding would reveal new potential sales models and marketing channels for their products.

In Company B3 the user and customer understanding was seen vital for their business. Foreseeing the new needs and upcoming trends helped the company to develop new products and product modifications on time. Being on time with new trends was one of the most important things for keeping the company's status as a business shaper in its field. Since the product itself was fairly uncomplicated, the company developed services alongside the product to help customers with their problems, and improve the overall customer satisfaction. Thus understanding the problems the customers encountered, and how to help them was essential. Understanding comprehensively all different kinds of user profiles refrained the company from overemphasizing one profile and directing all the marketing there. In business-to-business, the close interaction reaffirmed the relationship, as the salesperson and the customer modified the product parameters together, and gave feedback to the product development for future improvements. Also utilising the understanding for forming the company brand, affecting the everyday life of people, and just being for help to the customers were considered important. One of the important aspects was that the user and customer research helped them to understand what the real people think, because the company people were too experienced in their own field.

"I try to preach, that we ourselves are not fully authorized consumers. We are too much insiders."

(Benchmark company B3, Innovation management, Iv_B3_1)

The interviewees of the company B2 and B3 had sometime purchased a product they sell by themselves as well. This gave them a broad understanding of the whole process of procuring and installing the product. This was important, because the product the companies sold was only small part of a bigger project. For instance if a user is doing reconstruction of a summer house, he needs to find the right information what to do, find reliable professionals to do the project, choose the products and equipment, negotiate a good price, and give the instructions to the professionals how the result should be like. This understanding helped to argue for the product benefits from the viewpoint of the customer, and to provide the

solutions to the most common challenges. This was also utilised in marketing to explain the whole procurement process, and to convince how easy it is.

The company B3 believed they could gain benefit from knowing more about the consumer's train of thought when purchasing and using the product. They would have wanted to use this knowledge to create tools to share the same feeling to the other consumers, who consider the project too laborious or difficult. Being hesitant, if the decision on the product is right, was considered as one of the biggest restrictions that kept the consumers from buying the product.

Table 6. Perceived value of user and customer interaction in commercialization.

Benchmark company B1	Benchmark company B2	Benchmark company B3
<ul style="list-style-type: none"> -Ensure product fit to the needs, and context of use -Educating the company to become specialists, and further foresee the pitfalls -Understand the whole context of use the product is part of -Argue for the product benefits to the customer 	<ul style="list-style-type: none"> -Collect interaction specific information from sales meetings to share in the company -Analyse the sales situation based on customer profiles -Salesperson knows which product to recommend to the customer -Convince the customer, and provide needed information and solutions for the whole procurement process -Direct and find new marketing channels -Find new potential sales models -Argue for the product benefits from the customer's viewpoint 	<ul style="list-style-type: none"> -Foresee new needs and trends, and launch new products on time, keep the status of a business shaper -Develop services alongside the product to improve customer satisfaction -Understand different customer profiles and not overemphasize one in marketing -Create new tools for marketing -Form the company brand -Affect the everyday life of people -Be of help to the customers -Understand what real people think, because the company is too experienced -Create closer relationships

3.2.3 Approaches for studying users and customers

The benchmark companies mentioned a great variety of different kinds of approaches for studying their users and customers. Many of the methods were present in all three companies, but some were embraced by only one company. The differences in using the methods are due to the differences in their customer base.

The companies did not find it important to make a differentiation whether the methods they used are user centric or market oriented. Benchmark companies B1 and B3 considered to cover a good variety of different kinds of approaches in their projects. Only benchmark company B2 would admit, they could benefit from more systematic studies on their end users to learn about their daily lives and feelings. The following table summarises the methods used in the benchmark companies and

classifies them under Sanders and Dandavate's (1999) three categories of say, do and make.

Table 7. Methods used by the benchmark companies, classified to say, do and make methods.

	Company B1	Company B2	Company B3
SAY	Questionnaires about prototypes Business customer needs at sales discussions Business customer interviews User interviews Competitor product analysis Analysing similar fields of business	Customer interviews Sales discussions with customers Feedback questionnaires Sales figure analysis Benchmarking	Visiting consumer fairs Taking part in consumer fairs Following consumer trends Benchmarking Sales figure analysis Retailer interviews Discussion on trends with suppliers Focus groups Neurological studies Tracking website behaviour Online consumer profile test Customer call center Presenting ideas in a consumer network
DO	Observation at field Videorecording of usage Testing prototypes at consumer site Test use the product by oneself Feedback on paper prototypes and concepts "Agents" studying the field		Observing customer behaviour at retailer store Testing a new product at consumer's home
MAKE	Internal workshops with sales and R&D	Mystery shopping at retail store Video diaries Procure and use the product by oneself	Mystery shopping at retail store Evenings for professionals Internal ideation workshops Procure and use the product by oneself

The most strongly covered area was the traditional methods for studying what people say. The companies were most familiar with these methods, and they were used frequently in their projects throughout the organisation. These methods provided them with understanding e.g. which products are most marketable, which

packages were the most appealing, and how their products are positioned in comparison to competitors.

The observational methods studying what people do were most strongly present in the company B1. One reason for this is that their products are in use by users in their daily work, and designing for usable and safe products requires constant user testing. The Company B1 went repeatedly to visit the users' site to video record their daily environment of operation. The products offered by companies B2 and B3 required less interaction with the user on a daily level, and maybe therefore the observational methods were not as present in these companies. Nevertheless, the product of both companies B2 and B3 required a procurement process and an installation which are intensive interaction phases. Thus both companies could have taken an advantage of more observational studies about the procurement and installation of the product.

One of the reasons why the observational do-methods were so little used in the company B2 was that their organisation was more sales and technology driven than design driven. In contrast, the company B1 was more design driven, and therefore used more observational do-methods in their business. The sales oriented people talked more about statistics (e.g. 40% of Finns choose wallpaper over paint), while the design oriented people talked more about the problems of use (e.g. one second time lag in turning the wheel makes steering dangerous).

The companies used very little of the creative and participatory methods to learn what people know, feel, and dream. The methods classified in this section are not perfect representations of being creative and participatory, but had the most potential of all the methods listed. The internal workshops used by companies B1 and B3 did not include real users, which is one of the principles of empathic design (Koskinen, 2003). Nevertheless the internal workshops were creative, and could be considered to be included in the make-methods. Mystery shopping used by companies B2 and B3 is a participatory tool, but it focuses more on the questions about product positioning, and less on discovering information about the user's viewpoint.

Video diary method used by the company B2, and the evenings for professionals arranged by the company B3 possessed the most potential for learning from the user's world. The companies B2 and B3 used these methods with an open mind, and they considered to have learned a lot of surprising insights. All the benchmark companies thought they would benefit from knowing more about the end users' lives and their context of living in more detail. These learnings are necessarily not translated to business understanding, but as one of the interviewees at company B3 said, looking behind the research findings can help to see a lot more. Thus, the methods studying what people do, and what they know, feel and dream could be studied more in all of these companies.

“It would be interesting to know more about the spontaneous thoughts. What matters, what is the train of thought, the feelings during the process, and when you get it ready. That’s where we have a big gap.”

(Benchmark company B3, Marketing department, Iv_B3_2)

In the following the methods the benchmark companies valued the most, and can give valuable insights in commercialization will be discussed more thoroughly.

1 Evenings for professionals. The benchmark company B3 had organised several educational evenings for professionals that produce services for consumers. During these evenings the company B3 introduced their new products to the professionals, and let them try those out, and educated them on a topic related to the profession. Additionally, the company gathered new ideas from the professionals on how to apply the products, and feedback what the professionals thought about the products. This way Company B3 was able to enrich the product offering and to create the desired experience around it. These sessions also worked as a source of customer information. The company B3 could profile the professional customers, and gain information about the consumers as well. Naturally this approach has required the company to put investments to first establish the process, but once the process and customer base is established it has been lightweight to continue using the method.

2 Internal workshops with sales and R&D. The company B1 organised often workshops that brought people from the departments of sales and research and development (R&D) around the same table. Both parties possessed a great amount of knowledge about their customers and end users, but from different viewpoints. The people from the sales department had a close relationship with the business customer, who made the decision to purchase new products to be used by their employees. The R&D people had a close relationship with these employees, who are the end users of the products the company B1 delivered. When the knowledge about the business requirements and the user needs was combined, the sales and R&D teams could better understand how to communicate the product for the customer, but also to generate new product ideas.

3 Video diaries. All the benchmark companies used methods that focused on understanding the everyday life of the consumers. The company B2 used video diaries as a method to study the end users’ lives and their big project the product was part of. The users recorded small videos on regular basis to tell what they thought about the product before taking it into use, and later when they had taken it into use, and whether they encountered any problems with it. After the video recording period, the users were interviewed. This method required good planning, access to suitable users, and a lot of time to

do the analysis. Therefore they decided to order the study from a consultancy company.

4 Testing a new product at user's home. The benchmark company B3 tested their new products with volunteer users, who had an intention to buy a similar product, and use it at their homes. They were considered good volunteers because they provided the company with a real life setting to test the product. The company B3 gave the product to the user, who used the product at their home. After some time a developer from the company came to visit the user's home to analyse the product in use, take pictures, and discuss how the user perceived the product. The user was responsible to report the company regularly how the product worked during time.

5 Customer feedback through customer call center. Company B3 received valuable feedback through their telephone customer service. Not only consumers but also professionals and retailers utilise the customer service when having problems with the product, and to ask for advice for choosing the right product and tools. This provides the Company B3 with valuable information on the daily questions and problems the customers are troubling with. This can provide the company with more realistic insights to the customers' problems than a feedback questionnaire, because the customers express themselves on their own initiative, and thus are more likely to express what they find important.

6 Mystery shopping - Gathering information from the retailer. The idea of the method is that the researcher acts like a real customer, and observes the process and procedures of delivering the service (Wilson, 1998). In the case of the companies B2 and B3 the mystery shoppers went to a retail store, to see how their own product was sold. At company B2 mystery shopping had been done only once by an outsourced party. The company B2 wanted to find out what the salespeople know about their products, which services and products they sell, and which competitors' products are mentioned to the customer. This way the company B2 understood what the buying process is like in the eyes of the customer, and what kinds of questions they ponder with when making the purchase decision.

Company B3 sent their employees to the retailer store yearly to do mystery shopping (anonymously), interview salespeople (introducing themselves as company representatives), and to write down remarks on the packages of their products, and the presentation of their own and the competitors' products. This helped them to find out what the consumers ask for in the store, what do the salespeople recommend, and what the Company B3 should aim to improve.

7 Meetings with the customer. At the company B2 the salespeople worked closely with their customers, as each purchase was customised at the

customer's home. The systematic collection of information from the sales situations was shared to the other salespeople to prepare for sales meetings (e.g. what happens in the meeting, what the customer asks, what is discussed about, how the customer reacts to the offer, and how to finally get the customer to sign the contract). Additionally the Company B2 collected feedback from their customers with a high response rate. This helped the Company B2 to develop not only their physical products but also their service. The company B2 considered this as the most valuable channel for gathering new customer information.

3.2.4 Recommendations for conducting user research

The benchmark companies used a great variety of methods for interacting with the end users. Five learnings from the benchmark companies could be concluded for doing effective user research.

1 Share the same definition of user and customer in conversations. To avoid misunderstandings in conversations, people should share the same definition of user and customer.

2 Interact with all players in the value chain. The benchmark companies interacted comprehensively with all players across the value chain of their product. They studied consumers, professionals, retailers, users in the field, trends, and business customers.

“At first we of course meet the retail channel and they are the ones to pay for the product. But the retailer needs to get the product sold, so we need to get the information of the end users and to predict what they want.”

(Benchmark company B3, Innovation management, Iv_B3_1)

3 Include approaches to learn about personal lives. Several of the methods used by the benchmark companies were encouraging the users to express their desires and to tell about their individual lives. Good examples of these are video diaries, testing the new product at user's home, and organising evenings for professionals. When studying the user's personalities and contexts of living, the company understands more deeply how their product will fit in the user's daily life.

4 Use several different kinds of methods. The benchmark companies used several methods in different phases of the innovation process. The different methods provided different kind of information, so the suitable method needed to be chosen according to what was needed at the moment.

5 Share the understanding inside the company. The user and customer understanding was shared most efficiently in the company B3, but companies B1 and B2 had challenges in sharing the understanding. The Company B3 was using several different approaches to study end users, and was utilising the information throughout their innovation process. Thus the company had well actualized the

recommendation of human-centred design to integrate the users to the whole design and development process of a product (International Organization for Standardization, 2009). The distribution of knowledge was more efficient in the company B3 than in comparison to the other two. Three possible reasons for the effective knowledge sharing could be identified: 1) company B3 did a lot of user research using a diverse set of approaches, 2) the departments throughout the organisation were very interested in understanding the users' lives, and 3) also the people in sales and marketing department valued the user understanding for more than only the direct commercial benefit (e.g. being of general help to customers, and affecting people's everyday lives).

The interviewees at the company B1 considered to have sufficient communication across the departments. Most of the user research was conducted in the front end of innovation, and they did not see a need for new studies in the later stages. Nevertheless, the departments of R&D and sales were strongly separated, and user knowledge was shared with the sales department only in formal meetings. The R&D people strived to keep up the user's voice in the meetings, and to convince the sales about the user needs. The Company B2 had recently started to develop new practices for conducting user research, but were still in search of new methods. This information was mainly gathered in informal encounters with the users and customers, and delivering it further in the organisation was limited.

3.3 Conclusion

This chapter concludes the findings from the empirical research done at the benchmark companies. The three benchmark companies were globally operating industrial companies, and therefore comparable to the situation of the focal company A. The people interviewed at the companies represented the same departments as in the interviews at the focal company A - sales and marketing, product development, and innovation management.

The interviews gave answers to how the role of user and customer were defined in the companies, what was the perceived benefit of user and customer interaction, and how the companies conducted user and customer research. The difference between the terms user and customer was considered to be the clearest in a company that was design oriented, and among people from the R&D. In contrast, in sales departments, and in technology focused companies, the terms were practically used in parallel. Having a shared definition of the terms inside a company is essential for avoiding misunderstandings in discussions.

In general, the benchmark companies valued the user and customer understanding. Understanding on the final user was seen beneficial also in the B2B companies, because at the end of their value chain was the consumer. Understanding the user and customer needs helped the companies to ensure the product fits to the needs, to direct the marketing, and to form the company brand. Further the salespeople were able to recommend the right product to the customer, and argue for the product

benefits. Additionally, it helped the company to recognise new market opportunities, and to develop services that would improve the overall customer satisfaction.

The practices of doing user and customer research in the companies varied. The companies used varied methods, did different amounts of research, and studied different actors. The methods the companies used were mostly traditional market research methods, that lead to numerical and statistical findings. One of the companies creditably used methods to observe the users in their daily work. A few creative and participatory methods were used in all of the companies to study the feelings and thoughts of the users. One of the companies used these participatory methods regularly, and had established a stable pattern for keeping the users close to the development of new products. Finally five recommendations for doing customer research were concluded: 1) share the same definition of user and customer in conversations, 2) interact with all players in the value chain, 3) include methods to learn about personal lives, 4) use several different kinds of methods, and 5) share the understanding inside the company.

4 FOCAL COMPANY STUDY

This chapter describes how the focal company A was selected for this study, and the methodology for conducting the interviews. The findings of the interviews will be analysed, and compared to the understanding gained from the literature as well as the benchmark company interviews. The findings from this interview phase will be compared to the research questions of this thesis. Finally, the interest for the practical user research phase will be defined.

4.1 Methodology

The focal Company A was chosen for the study because they offered a chance to study a product innovation project, the Digital Wallcovering, which had recently been launched, and thus was in the commercialization phase. The company faced problems in increasing the sales of the new product, and was therefore in need for a new approach to gather information about the product market. This provided an optimal setting for exploring what kind of knowledge the sales department would need, and to try out gathering this information using the user research approaches.

The interviewees were chosen across the company from different departments, in order to cover all viewpoints of the development process. The interviewees represented the departments of innovation management, sales, marketing, customer support, and research and development. Altogether ten interviews were conducted at the company A. The interview structure can be found in the appendix A2.

The focus of the interviews done at the focal company A was to understand the structure of the company, their innovation process, and the Digital Wallcovering case. Further it was discussed, what is the importance of user and customer knowledge in the company, and which methods they use for gathering the knowledge. Specifically for the Digital Wallcovering case, the aim was to understand what kind of information the interviewees possessed on the end users and customers of the product. In the analysis, the viewpoints of all business units are drawn together, and overall picture of the innovation process of the case is formulated. The similar and dissimilar perceptions of the end users between the business units are presented, and perceived challenges in the case are concluded.

4.2 Digital Wallcovering case

4.2.1 Digital Wallcovering product and innovation process

The interest for this study was offered by the focal Company A, a large scale company operating in the chemical industry. The company produces fiber based materials, which are used in various everyday applications. The company operates around the world in over 20 countries, the most important markets being Europe and North America. The business customers represent fields such as wallcovering, medical science and filtering. The net sales of the company in 2014 was 1 billion of which 15% was generated with new products.

The business case provided by the focal company A is a wallcovering material, which is easy to apply, reposition and remove. The speciality of this product was that it is easy to apply on the wall even by non-professionals, as it holds a water-activatable glue on the back side. In addition to being easy to apply, the material is of great quality. In contrast to traditional wallpaper materials, this material does not swell nor shrink, it does not get ripped, and it is thick, which generally creates a feeling of good quality. The primary customers for the product are digital printing companies, who print custom wallpapers for consumers and businesses decorating homes and public places, like cafés, hotels and offices. This material can be used to print the motif with digital printers, thus the product name Digital Wallcovering.

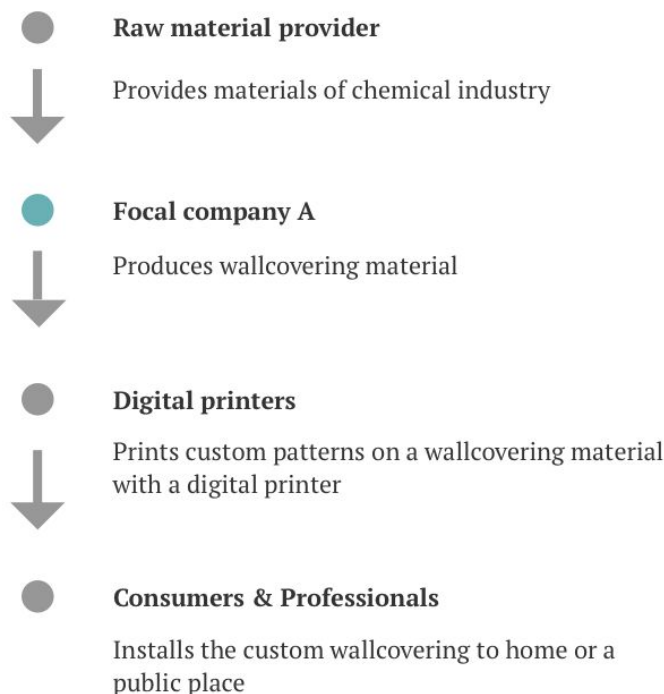


Figure 9. Value chain of focal company A.

The competitive edge of the focal company's products are the technical qualities and performance. Part of the new products they develop are profiled as radical, and they target at new markets. The new wall decor material studied in this research was profiled as one of these radical products. The process the focal company A used for developing these radical products was called Outcome Driven Innovation process (e.g. Ulwick, 2005). The company characterises the process to have a probe and learn approach (e.g. Lynn, et.al., 1996), where they can quickly try out a new product idea, get feedback, and develop it further. The different business units of the company seemed to be well aware of the new ODI process, and also excited about it.

The idea of the ODI process is to recognise what is the outcome the end customers want the product or service to do, and to turn that idea into a functional business solution (Ulwick, 2005). The ideology of this process is to turn the focus from treating end customers as innovators that are capable of communicating desired solutions, towards treating the end customers as sources of information about their desires and problems. Due to the application of this process also in the case of the Digital Wallcovering, the focal company A had a great interest in studying their end users. What is more, the company had an interest to understand how they perform in studying the end users, and how they could further develop their practices.

Digital Wallcovering could be considered as a market-pull innovation because the idea for the new product arose from a market study, and was tailored to fulfil the needs of the customers. The project also has the characteristic of a technology-push innovation, because the company developed a new radical technology that has potential for applications also in other markets. Developing the technology with several potential applications in mind is reasonable, because often the full potential of one technology is found through several projects (Parker and Mainelli, 2001).

Digital Wallcovering was one of the first projects in the company A to follow the Outcome Driven Innovation process. The product development team succeeded in developing the product with a fast schedule compared to the usual time spans for a new product development in the company. Despite the demanding and fast schedule, the product fulfilled the quality and functionality requirements set for the product in the initial market study. The aim was to bring the product fast to the market, and to launch it at an exhibition for wallcoverings. The first version of the product was ready at the time of the exhibition, and some enhancements were made afterwards in product qualities and production process. The phases of the project will be described in the appendix B.

4.2.2 Original definition of the customers and end users

The Outcome Driven Innovation process encourages the focal company A to define both the direct customer segment but also define what is the group of end users. These end users were defined based on the findings from the initial user studies, that aimed at understanding individuals' problems in papering. Additionally the company used their knowledge on the business field and their business customers.

Three potential groups of customers and users were recognised:

- 1) Direct business customer: a digital printing company

Prints customized wallpaper based on individual people's and companies' orders.

- 2) End user: a do-it-yourself renovator (DIY)

Orders a wallpaper with a custom motif, and is ready to pay for a premium price for good quality and easy installation.

- 3) End user: a professional renovator, or a company with a public place (hotel, cafe or office)

Needs custom wallpaper but wants to save in installation costs by purchasing a material easy to install.

One reason to target the digital printers as the business customer, was that the profit margins of the custom wallpaper were better than for the bulk wallpaper sold at retail stores. As another reason to choose the digital printers, the digital printers were believed to be interested in this product, because it ensured healthier working conditions. The Digital Wallcovering material does not produce as much harmful dust during printing, as the traditional wallcovering material (Iv_A_10).

The end users, both the do-it-yourselfers and the professionals, were customers of these digital printers. One of the user needs recognised in the study was that the papering should be made less messy and faster, and it should be possible to move the paper while applying it on the wall (Iv_A_6). This meant the end users should be people who actually apply the paper on the wall themselves. The digital wallcovering material is more exclusive compared to traditional materials, so the focal company A believed the people ordering custom wallpaper would be willing to pay a premium price for the convenient papering (Iv_A_10). The do-it-yourselfers was more clear as an end user group than the professionals, and therefore chosen as the primary end users to design for.

4.2.3 Challenges in commercialization

Until the launch of the Digital Wallcovering, it was believed the product meets the emerging needs of the market, and it holds a good sales potential. The product had been introduced to the market on time. The first printing companies gave promising feedback for the trials. Despite the promising situation, after a year in the market the product had not received as much orders from new printers as expected. The sales increase was lagging, and the sales department started to analyse the situation again.

The sales department speculated possible reasons for the low sales. One assumption was that the price of the product was too high. The digital printers used

accumulative pricing, and therefore the price of the final product was considerably higher compared to wallpapers of regular material. Another assumption was that the business customers were too conservative to take new radical product into use. The company needed to get more business customers of reference that would attract more customers in the future.

The focal company A was waiting for an increase in sales, but was also ready to pull back from the market. As one attempt to increase the product sales, the sales department tried to increase the intensity of contacting new business customers, but were scarce in resources.

“At this point, it is pointless to think about the product development anymore, because we already have a product. So right now you should start contacting more customers, just go for it.”

(Focal company A, Sales department, Iv_A_7)

As another attempt to increase the sales, the sales department needed to re-evaluate the price, position and marketing message. To know how to do it, the company A needed to understand the end users, and the business field better. This created an interest for this study to explore, how the end users should be studied in this case. Chapter 5 will explain in more detail, how the new end user studies were conducted in the context of digitally printed custom wallpaper.

4.3 Results: drawbacks caused by low user understanding

The interviews done at the focal company A revealed some contradictions how the departments understood their end users. As the departments had an insufficient understanding of the end users of the Digital Wallcovering, the decisions on the product pricing, positioning and marketing did not achieve their targets. This can have influenced the moderate sales of the Digital Wallcovering.

The following subchapters will discuss in more detail, where this unfavourable situation originated from. More specifically, it is discussed how the roles of end users and customers were defined in the company A (4.3.1), how much and in which ways the users were studied (4.3.2), how the information was shared among the departments (4.3.3), and how the product price and positioning were defined (4.3.4). The appendix C will explain also other challenges uncovered in the interviews.

4.3.1 Conception on role of users and customers was not shared among departments

The different departments defined the users and customers differently. The people at the development department were the most open minded in studying the end users. They considered the customers to be the direct business customers who will still refine the product. According to them, the users were the individual consumers who used the finalised product. They saw a benefit in considering these entities as separate, because understanding the needs of the end users, the company might

come up with new product ideas not otherwise acknowledged by their business customers.

“If we had more information about the end users, we might understand their problem differently than our direct customer, and then be able to offer something different.”

(Focal company A, Development department, Iv_A_8)

The sales department considered everyone equally as customers, let them be the business customers or the final consumers. They recognised that the different customers have different needs, but were primarily in contact with their direct business customers. The sales department believed the company has usually no clue about the end users. They saw a risk in being in contact with the business customer's customers. If the business customer found out that the focal company A had been in contact with their customers, it could be considered as spying and harmful for the business relationship. The business circles in this field are fairly small, and therefore this risk is likely. Additionally the sales department had very little resources and time for the research, and wanted to invest the effort in discussions with their direct customers. Thus the sales department had not given much time to study the end users, and therefore did also not find it very useful to separate the two.

“How we usually talk, is that they are pretty much the same, unless we are splitting hairs. The user is maybe the one who is left with the product. But if we are talking about customers, it covers everyone after we have sent our product somewhere.”

(Focal company A, Sales department, Iv_A_7)

The marketing department considered the business market and consumer markets to be clearly separate. They saw consumers as an important source of information that business customers could never provide. Nevertheless, they considered it important to focus on being in contact with the business customers. Creating a marketing campaign for the consumers would not have paid back, because the purchases are smaller from consumers than from business customers.

“We’ve obviously, spoken with consumers. But we’re not heavily promoting it from a b-to-c marketing point of view.”

(Focal company A, Marketing department, Iv_A_6)

4.3.2 Amount of user and customer understanding was limited

Even if the customers and end users were recognised important for the company, no one of the interviewees believed the end users were studied much. Projects following the new Outcome Driven Innovation process were believed to include a bit more user studies than regular projects. The product development department said user studies were done mainly by the marketing department, if much even there.

“We’re not doing user or customer studies in product development. I think the marketing people are doing market studies, customer studies and stuff like that.”
(Focal company A, Development department, Iv_A_8)

The product development department possessed little information about the end users, but neither had they much interest in it. The most important information they needed was the specification of product requirements for a new product (Iv_A_9). Also feedback from a business customer was valuable. This was received most often for products the customer needed a modification for, like making a material thinner (Iv_A_4).

The sales department didn’t have a lot of information about the end users, but they held a great amount of information of their business customers and the business fields of their projects in general. Most of this information was gathered among personal relationships, and meetings with the business customers. The amount and nature of information the sales was able to gather was dependent on several parameters (Iv_A_7):

- The bigger the company is, the more they keep the information to themselves, because they want to keep a better positioning in negotiations.
- On certain business fields, people tend to be more frank or more closed.
- Strong cultural differences create communication challenges.
- The better the relationship among the individuals, the easier it is to talk.

As advised by the ISO standard of human-centered design (International Organization for Standardization, 2009), the users should be integrated throughout the whole design and development process of a new product. In the Digital Wallcovering case, the presence of end users was focused in the beginning of the project, and at the end of the product development phase. In the beginning of the project, the marketing department made analysis on the emerging needs in the market. At end of the product development phase, the studies focused on analysing the product qualities. The final product was tested by the development team at their own homes, and by business customers who were given trials and asked for feedback. In addition, one focus group session was done, to study if the end users found the product valuable. This information was used for sales arguments, and in the marketing material. The understanding derived from the research done during the project produced information that was statistical and generic, and not representing the real purchase behaviour. Thus it would have been useful for the focal company A to integrate the users more closely to the project.

In general the variety of user and customer research methods used in the focal company A was not vast. The few methods used focused mostly on studying the business customers. This was natural, since the company was operating in the B2B industry, and was in contact mainly with their business customers. The methods the company A used could be profiled as market research methods, that produce numerical, statistical and generalisable information (Hanington, 2003). The

following table 8 summarises the methods used by different departments of the focal company A.

Table 8. User and customer research methods used at the focal company A.

Department	Methods used
Marketing	<ul style="list-style-type: none"> - focus groups - trend analysis - consumer interviews (conducted by external consultancy company)
Research and development	<ul style="list-style-type: none"> - business customer requests on product modifications - inhouse technical tests - benchmarking: technical analysis on competitor products - no contact with consumers
Sales	<ul style="list-style-type: none"> - business customer meetings - exhibitions - sales numbers and trends - sending sample products to business customers + collecting feedback - no contact with consumers
Customer service	<ul style="list-style-type: none"> - business customer meetings - business customer feedback - no contact with consumers

4.3.3 Information was not shared efficiently between departments

As explained by Beard and Easingwood (1996), commercialization is critical part for the product success, because the company usually has only one chance to launch the product. During launch the company needs to communicate how the product fulfils the need it was designed for. Leonard and Rayport (1997) add that the whole commercialization phase is as important for building up the right experience as the product itself.

In the Digital Wallcovering case, the sales department would have needed more information on the end users in order to successfully commercialize the product. Much of the information they needed already existed in the company, but was not delivered from one stage to another. They had same questions about the target market as asked previously during the process. For instance the sales department was wondering whether the targeted end user market should be do-it-yourselfers or also professionals (Iv_A_7). Meanwhile, the product development department considered the primary target to be do-it-yourselfers (Iv_A_8). Originally, the marketing department had defined the do-it-yourself market to be the primary one, but identified the professionals also as one possible market (Iv_A_6). Neither sales

nor product development knew how the target market was defined, but they made a guess based their on own experience on the business.

The delivery of information between the departments was seen poor also in other projects at the focal company A. Usually when a product was ready for commercialization, an information package about the product was delivered to the sales department. The sales package included A4-samples and a technical description. Also an internet discussion was held, where the head of product development and the sales team discussed together about the product. The level of information exchange was not considered sufficient. The interviewees from the sales department explained, they did not know what the research and development team was working on:

“At ours the product development has been a bit like that the developers work quietly by their desks, and only when they are ready they come out with their product.”

(Focal company A, Sales department, Iv_A_7)

Three reasons were recognised, why the information did not get delivered efficiently between the departments. First, the information was delivered in a condensed format from one stage to the next one. For example results of the initial market study were communicated in the format of conclusions while the departments could have benefitted from interview transcriptions and videos (Iv_A_6). Second, the departments did not ask for additional material, they were not aware of the existence of all the material, and did they did not know who to ask for it. Third, the departments were interested only in the information relevant for their task at hand, and nothing more.

“I closed my ears from it [use context and user needs] because I was focused on the development of the technology.”

(Focal company A, Development department, Iv_A_9)

4.3.4 The departments disagreed on the product price and position

The development and sales departments disagreed on what is the right price for the product. The price was defined early in the development process because the development team needed to evaluate the profitability of the new product along the way, and the material and development costs needed to be kept to a tolerable level. In the beginning of the project, it was expected that digital printing should generate the best profits, because digital printing had better profit margins than traditional printing. The sales department considered the product price to have been set based on vague understanding, and believed the whole wallpaper market was about to decrease. Based on their knowledge on the market and discussion with some of the business customers, they considered the price too high. Thus the sales team needed to sell the product with a high price they could not lower, because it might risk the profitability of the product.

Defining the correct price was dependent also on the price the end user wanted to pay for the finalised product. As discussed in the previous chapter, the departments were not in agreement on which one should be their end user market - do-it-yourselfers or professionals. The development department considered the do-it-yourselfers, i.e. the individuals decorating their homes, to be more important. The sales department acknowledged the do-it-yourselfers, but considered the professionals to be equally as important, including hotels, restaurants and construction companies. Agreeing on the end user market would have been crucial, because it affects the potential price of the finalised product.

The sales department stressed the importance to discuss the potential costs and profits of the new product together with the different departments. They thought the sales department should have been asked for an opinion on the price that could possibly be got in the market. In addition, the production should have been asked how much the product would cost to produce, and whether they have the capacity to produce it.

4.4 Results: potential value of new user studies

The interest for doing new user and customer research for the Digital Wallcovering case is presented. Implications from literature and benchmark interviews will be discussed.

4.4.1 Need for new user understanding

The sales department of the company A was given the responsibility to answer for the success of commercialising the Digital Wallcovering project. Because the product had not met the targeted sales, the sales team needed to come up with new tools to improve the sales. As one solution they tried to increase the intensity of contacting new business customers, but were scarce in resources. As they could not do more intensive selling, they needed to refine the market positioning, product price or the marketing message. In order to understand how they should do this refinement, they needed new information on the target market and the end customers, because they had limited access to the original research material, the previous research was generic, and it did not represent the real purchase behaviour.

The company A believed that through new end user studies, they could validate the presumptions made of the end user needs. Additionally they could understand why the product has not been selling as well as it was predicted. Also they could gain ideas which of the product qualities should be highlighted in marketing, and in sales meetings with the business customers. Together with the sales department, a list of questions to know more about the end users was defined:

- What kind of people the end users are?
- How big areas the users would paper?
- How often the users would change the wallcovering?
- What kind of picture or theme the users would choose?
- Which rooms the users would paper?

- Where do the users get the idea to print a custom wallpaper?
- How much the users would be willing to pay for the product?
- Is the assumption of the end user group correct?
- What is the “thing” in the product?
- Understand the context of use and user’s daily life.

New end user studies were conducted in order to validate if the end user understanding would be useful for the commercialization of Digital Wallcovering. Different methods were explored to find out what kinds of methods would produce the most useful information for the case. When choosing the methods to be applied, the following restrictions needed to be considered:

- 1) *Consider limited resources and expertise.* In future cases, the methods should be possible to be used by the sales department. The existing relationships and skills should be promoted, because the sales department had limited resources and expertise for doing the research. Encouraging the sales department to do the research was important for avoiding unnecessary simplification of the results, and to support the empathic understanding through personal interaction. Long-lasting or extensive research was not desired, because the product had already been launched.
- 2) *Aim for new understanding.* The aim is to produce as much new understanding to the case as possible. Therefore the methods or the subject of study should be new (e.g. testing the product in a focus group session should not be repeated).
- 3) *Focus on individual people.* The study should focus on the users of the finalised product. Further the focus should be on individual people rather than trends. The trends had been studied earlier in the project, and the company A seemed to be well aware of them.

4.4.2 Literature recommendations for new user research

In the previous phases of the project, the Company A relied on the traditional market research methods, that produce results in numbers and statistics. For instance in the focus group session done for testing the Digital Wallcovering, the results showed that 95% of the users would likely use the product, and it was 60% faster to apply the paper on the wall compared to traditional papering. These results are important for arguing for the product qualities in sales meetings and marketing. If only market research methods are used, there is a risk that the needs of the customers are not correctly understood. In today’s experience economy, products should not compete with purely technical qualities, but should offer a personal and memorable experience (Pine and Gilmore, 1998). To understand the thoughts and feelings of the users, creative and participatory methods are needed (Hanington, 2003). In the Digital Wallcovering case, the focal company A wanted to find good arguments how the product enhances the end customer’s experience, and to present this to the business customers. The prerequisite for this is to understand the user’s

feelings, and desired experiences. Thus, more observational and creative methods were needed in their research.

A salesperson who is capable of empathizing with the customer, and recognizing and responding to the customer's needs, is better at generating revenue and maintaining the customer relationship (Kidwell et.al. 2011). Further, as the purchase process is mostly affected by emotions rather than rational thinking (Zaltman, 2003), understanding the consumer's feelings can help to form an effective marketing message. Thus, improving the emotional intelligence through better user and customer understanding, can help the focal company A to improve their sales and marketing.

4.4.3 Benchmark company recommendations for new user research

The benchmark company research provided great practical advice for the focal company A. The advice included general recommendations for conducting user and customer research, and examples of good research approaches. The suitability and value of these recommendations for the focal company A are discussed in the following.

Recommendations for conducting user and customer research:

- 1) Share the same definition of user and customer in conversations.* The people at the development department and the sales department of the focal company A were using the terms user and customer differently. This was a similar problem recognised in the benchmark companies, and it can easily lead to misunderstandings in discussions.
- 2) Interact with all players in the value chain.* The focal company A focused heavily on the business customers and trends. This scope could be broadened to include also consumers, professionals and retailers.
- 3) Include approaches to learn about personal lives.* This aspect was yet little covered with the methods used by the focal company A, because most of the used methods focused on studying trends, and interacting closely with business customers. Thus, new methods to focus on personal lives could be useful.
- 4) Use several different kinds of methods.* Focal company A could broaden the portfolio of different user and customer research methods. This would help to study the different players of the project, and taking into account their differing needs.
- 5) Share the understanding inside the company.* The difficulties of sharing knowledge inside the company was encountered in the focal company A, similarly to the benchmark companies, and even the reasons for this were similar. The focal company had little collaboration between the departments, all the departments did not value the user knowledge, and much of the information was gathered in informal encounters with the business customers.

Suitability of the approaches recommended by benchmark companies

The following discusses how the methods recommended by the benchmark companies could benefit the Company A. These methods were new for the focal company A because the company had little interaction with consumers, even though their new product was a material for a consumer product.

1 Evenings for professionals. During the time of this study, the focal company A had recognised a new potential business customer, and considered applying the method 'evenings for professionals' recommended by the benchmark company B3. They considered using the method to demonstrate the new product, and to argue for its qualities to the customer. Also, the method would help them to gather insights from the business customer on how the product would fit to their needs, and how the product could be developed. As another possible target, the company A could try out the method with professionals in interior design. This could enhance the penetration to a new business field, since the Digital Wallcovering is currently less used among professionals than do-it-yourselfers.

2 Internal workshops with sales and R&D. The focal company A had limited occasions where to bring sales and R&D teams together. Usually the teams met when a new product was to be introduced to the market. The R&D presented the product to the sales team, who would ask questions about the product. Based on the interviews done at the focal company A, sharing the knowledge across the departments might have been one of the possible reasons for the challenges of the Digital Wallcovering case. A few workshops had been organised in the company A, but they consisted of people across the whole company, and were considered too laborious and unproductive. Therefore it could be more productive to bring together only those people who are working on the same product. They could enjoy a shared interest, and intimacy between each other.

3 Video diaries. This study provided the company B2 with personal insights to users' lives and valuable understanding of the use context. This type of knowledge was rarely present in the projects of the focal company A because they sold their products to B2B customers instead of consumers. Nevertheless it would be valuable for the company A to understand the end users' lives, because their product is indirectly sold on the consumer markets. Using a similar method to video diaries, the company could understand what kind of problems the users encounter, what the users do to overcome them, and how the product affects their lives.

4 Testing a new product at user's home. Testing new products with the end users would be a valuable method for the focal company A to use. The method would be especially suitable for studying those products that are finalised, and ready for the consumer to use. This method might have been too laborious for the Digital Wallcovering case, because it would have required to let the consumer choose a

pattern, and to print the paper. This would require additional effort to organise the tests with volunteer test users, and collaboration with digital printing companies.

4.5 Conclusion

This chapter summarises how the insufficient understanding of the end users and customers contributed in the unfavourable situation of the Digital Wallcovering case. Furthermore, the interest for new user research will be explained, together with the recommendations from literature and the benchmark companies.

The new Digital Wallcovering material developed by the Company A had recently entered its commercialization phase. Despite the newness and clear competitive edge, the sales did not increase as wanted and new orders were not placed. The sales department was in a challenging situation, and needed to reconsider the product pricing, positioning and marketing.

The study done at the focal company A revealed a shortage of shared end user understanding in Digital Wallcovering case. Despite the Outcome Driven Innovation process model, the project was not supported with enough information on the end user needs. Four reasons were recognised how the limited end user understanding might have influenced the difficulties to commercialize the product:

- 1) The conception on role of users and customers was not shared among the departments. The development department saw users and customers completely separate, and found it beneficial to consider them as separate. The sales department considered everyone as customers - both the business customers and the end users.
- 2) The amount of user and customer understanding was limited. The focal company A used limited amount of research methods, and the studies focused mainly on testing the product qualities and uncovering the needs of the business customers.
- 3) The information was not shared efficiently between the departments. Information was delivered in a condensed format from one stage to the next one, the departments did not know how to access the information, and the departments were interested solely on information related to their task at hand.
- 4) The departments disagreed on the product price and position. The information on the end users and the target market was vague, and the decisions had not been discussed between the sales, development, and production departments.

To find out ways to improve the sales and marketing of the Digital Wallcovering, the company needed new understanding of the end users of the Digital Wallcovering. The previous research they had done had produced generic and statistical results,

and was not representing the real purchase behaviour or user's thinking. The company was interested to see if they had made false assumptions of the market, and if there was some new information they could utilise to improve their sales and marketing. A list of questions was defined with the sales department, to set the focus for new user research.

The recommendations of the literature and the benchmark companies were considered when designing the new user research. It was decided to utilise new research approaches the company had not used before, and include observational and creative methods. Further, it was considered beneficial for the sales department to aim for empathic understanding of the users. This can help to recognise the user needs more comprehensively, and be able to market the product in an attractive way.

As the benchmark companies recommended, the focal company A should increase their interaction with all players in their value chain, conduct user research to learn from the personal lives, and improve the knowledge sharing inside the company. The recommended methods provided good examples of creative and participatory methods. As such, the methods could not be applied to the Digital Wallcovering case directly, but many of their viewpoints were valuable, and should be considered when doing the user research.

5 NEW USER RESEARCH ON CUSTOM WALLPAPERS

The literature review concluded that user research is conducted more in the beginning of the product innovation process, and less in the commercialization phase. Nevertheless, interacting with users and customers throughout the innovation process is considered valuable for the product success. The benchmark companies recommended to share the user and customer understanding throughout the organization, and to learn also from the individual people's lives. The focal company A needed to uncover more information of the customers, and users of the Digital Wallcovering to improve the sales of the product.

In order to gain empirical understanding of how the user centered design approaches would work in the commercialization phase, the approaches were brought into practice. The Digital Wallcovering case provided a good setting for trying out the approaches. The project was in its commercialization phase but not all aspects of the users was seen to have been explored comprehensively, and therefore gaining new understanding on the users was seen valuable. Additionally, the targeted application of the new technology was clear, which made it straightforward to choose the user group for the study.

Three different user research approaches were applied to study the end users of the Digital Wallcovering. This chapter explains how these approaches were selected, and what is the methodology of the approaches. Furthermore, the results of the user study, and an analysis on how useful the approaches were for the commercialization of the Digital Wallcovering are presented.

5.1 Methodology

The focus and methods for studying the end users was defined based on the learnings from three sources: the literature, the interviews at the benchmark companies, and the interviews at focal company A. First, the literature was reviewed to understand the value of user and customer research for innovation process. Further, a classification of different user and customer research methods was concluded, and the circumstances where the methods should be used was analyzed. The recommendations of the literature was considered when choosing the methods. Tools from all three categories of say, do and make tools (Sanders and Dandavate, 1999) were included. Additionally Hyysalo's (2009) questions to consider when

choosing the right method, and Koskinen's (2003) principles for empathic design methods were bore in mind.

Second, the interviews at the benchmark companies provided great comparable examples of the methods and practices they used for studying users and customers in their business. Additionally it was discovered, which of the methods and practices provided the most valuable information, and what the companies used the information for. The recommendations given by the benchmark companies for conducting user and customer research were considered. As recommended, a varied set of methods were used. The methods the benchmark companies used were not applied directly as such to studies of the Digital Wallcovering case, but some of their characteristics were taken along (e.g. observing consumers in their own context, and doing the research at user's home).

Third, based on the interviews at the focal company A it was defined what kind of new knowledge about the end users of custom wallpaper was needed to be discovered. Additionally it was clarified, what kind of knowledge was already existing of the product, and what kind of methods had already been used. The aim was to try out new methods that the company would be capable of using in their future projects, and that would produce valuable understanding for the Digital Wallcovering case.

Three methods were chosen for studying the end users: business customer interviews, netnography and interactive feature conceptualisation. The number of three approached was considered sufficient for achieving generalisable conclusions on how user centered design approaches could be applied to commercialization. Due to the limited resources of the focal company A, and the uncertainty of the usefulness of these approaches, the user research was conducted by the researcher of this thesis. The following three subchapters explain the reasoning behind selecting the three methods, and how they were applied in this study.

5.1.1 Business customer interviews

The first method was studying two digital printing companies with a semi-structured interview method (Wengraf, 2001). The focus of the interviews was the business field in general, and their customers. These two companies were chosen for the reason that they were represented different end customers. The first business customer company C1 was operating with designers working for business customers, and the second business customer company C2 was operating with individual consumers. The number of two companies was considered adequate for this study, as the aim was to try out whether this method would reveal relevant information of the end-users on the case.

The interview represented the say methods of Sanders and Dandavate's (1999) classification. Considering the resources of the focal company A, this method was lightweight enough to be used by sales and marketing people, and the access to the business customers existed already in the focal company A. As recommended by

Hyysalo (2009), considering the resources and the existing capabilities are key questions, when choosing the applicable methods.

Interacting with all players of the value chain was one of the recommendations from the benchmark companies. The focal company A had already interacted with the digital printers, but doing a proper interview about the customers of the digital printers was new, so it was potential to discover new information. Further, the digital printing companies possessed essential information of the consumers' preferences. The interview structure for the business customer interviews can be found in the appendix A3.

5.1.2 Netnography

The second user research method chosen was netnography (e.g. Kozinets, 2002). In short this means ethnographic research done in online communities to understand the needs and decision influencers in a group of consumers. Key difference to traditional ethnography is that in netnography, the content is restricted to the expressed communication online, instead of a complete set of observable behaviour. (Kozinets, 2002.)

The method was applied to inspect more closely two online communities: online customer review site and decoration blogs. On the online customer review site, customers comment and review the services of online stores. The review site was found through one online store that prints custom wallpaper. Studying the blog posts was chosen based on the benchmark interview at the Company B3, as they considered blogs as one of their most valuable marketing channels to reach consumers, and they received a lot of valuable information of the consumer trends through the collaboration with the bloggers.

Netnography allows to study the community in its natural context, and the users are not being asked questions. Therefore the method can be classified as one of the observational do methods of Sanders and Dandavate's (1999) classification, even though the focus is in written expressions instead of whole bodily and verbal behaviour. In comparison to traditional ethnographic research, netnography is less time consuming. Efficiency is good considering the usual limited resources available (Hyysalo, 2009). See appendix D1 for more detailed description of the process.

5.1.3 Interactive feature conceptualisation

The third method chosen was interactive feature conceptualisation (Bauersfeld and Halgren, 1996). In this technique a user is interviewed, and simultaneously the interviewer writes keywords of the interviewees expressions about the product on sticky notes. At the end of the interview, the notes are given to the user to evaluate their importance of them with A (very important), B (important) or C (somewhat important). The unimportant sticky notes are discarded, and user can add new notes about aspects she considers being missed. Then the user asked to group the notes

into categories, give labels to the categories, and explain the reasoning of the categorisation. (Bauersfeld and Halgren, 1996.)

Interactive feature conceptualisation is a method that helps to recognize what kind of terminology the interviewees use to talk about the product, and what things they find important. This is often hard to do in a regular interview, because the interviewer easily interprets certain things to be more valuable for the user, if the interviewer has an interest for some certain kinds of results.

Interactive feature conceptualisation method was used to study four users that were either planning to purchase custom wallpaper or had already done so. Including real users is one of the key principles of empathic design research (Koskinen, 2003). Two of the users studied were customers of a company producing customised wallpapers, and two were contacts through the researcher's personal acquaintances. The aim of the study was to understand the procurement process, the influencers of the decision making, and the meaning of the product to the user. Further the aim was to understand what the users valued in decoration, and in their private homes or offices. A detailed description of the interview structure can be found in the appendix A4, and the selection of users in appendix D2.

Since this method was engaging the users in a creative way, this method should be classified as one of the make tools (Sanders and Dandavate, 1999). The method was conducted in the same room where the user planned to or had applied the wallpaper. One of the interviews was done as a video call, because the interviewee lived abroad. Doing the research in a real context makes the interview more fruitful (Mattelmäki, 2006), and enables recognizing things that would otherwise be hard to describe verbally. The principles of empathic design research (Koskinen, 2003) were well embraced, as the method was visual and tactile, cheap and low-tech, interpretive, playful and fun, and used in real context. Artifacts like the final wallpaper, and inspiration material were used to increase the visual, tactile and playful aspect. The principle of targeting the fuzzy front end was naturally not considered, since this study questions if the empathic design methods could prove to be valuable also in commercialization.

This method answered the best to the recommendation of the benchmark companies to learn about the individual people's lives. This method was also closest to the method of testing a new product at user's home. In order to ensure a real life situation, the users were not given a trial product, but the product to be studied was the one the user had already chosen.

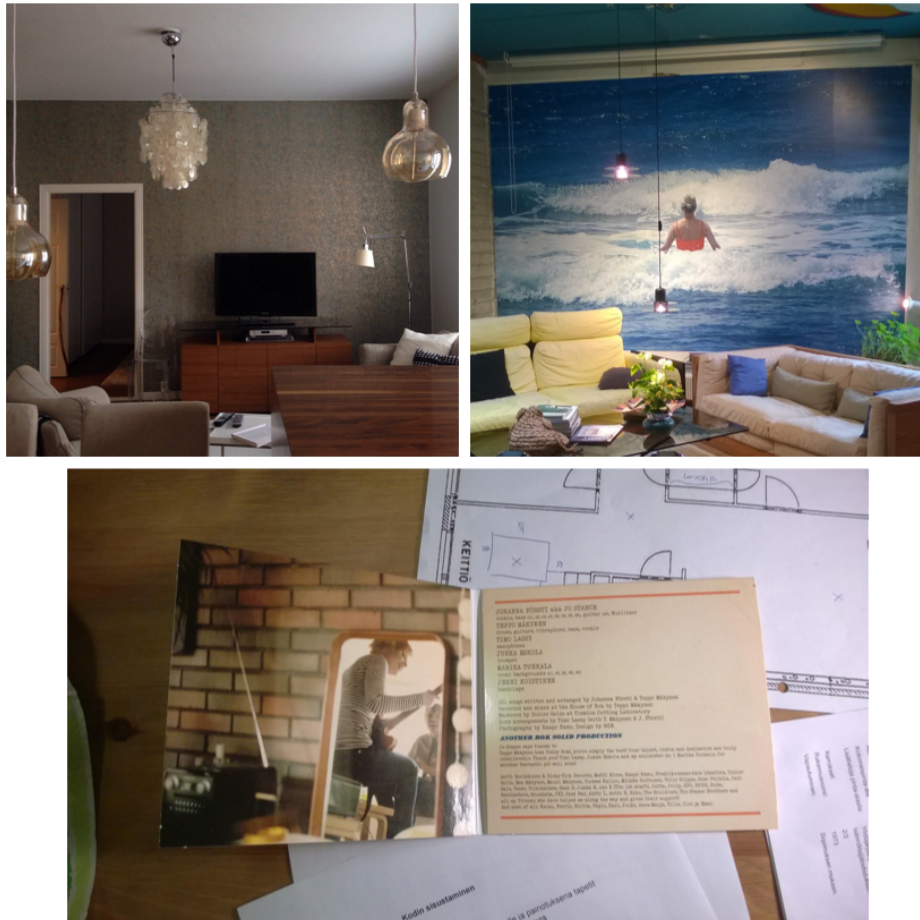


Figure 10. Wallpapers and inspiration material of the users studied with interactive feature conceptualisation method.

5.2 Results

The three methods gave varied insights as was expected, because the methods were very different. The following chapters analyse the pros and cons of the methods (chapter 5.2.1), the nature of the findings from each method (chapter 5.2.2), and the value of the findings for the focal company A (chapter 5.2.3).

5.2.1 Advantages and disadvantages of methods

The business customer interviews provided general information about the whole business, and the interaction with the customer. Much of this content is probably already covered in regular business meetings, and therefore the motivation for the interview should be considered carefully. The user's perspective was left weak in the discussion, because the interviews did not involve the real users. If the business customer knows only little about their customers, they are naturally not capable of sharing much about them.

Finding applicable business customers to interview should be easy, because the relationships are already established. At least during these two interviews, the

business customers were eager to tell about their business, and to help. In reality, when the interviews are done by a company representative, aspects like the quality of the relationship, and the interviewer's personality are likely to affect how open the discussion will be. Additionally, the company needs to consider carefully, how this business sensitive discussion is to affect the business relationship. Doing the interviews took fairly a long time, but in real life case, this interview could be done as part of an other meeting.

The netnographic research on the online customer review site provided insightful understanding with fairly small effort. This method is very useful for understanding the process from the consumer perspective, and what they value in the service. The high number of answers enabled a statistical analysis, and improved the trustworthiness of the data. Additionally the reviews included a few very detailed comments on the service experience, and the whole process of the product procurement. The discussion on the site is natural, and not biased by the questions or presence of an interviewer. As a downside, the interviewer is not able to ask to elaborate on some interesting topics. The material on the online customer review site was easy to access, but using the material was restricted by terms and conditions of the site.

Studying the decoration blogs did not provide usable information for this case, since the trustworthiness of the product reviews and experiences was questionable. The reason for suspecting this is that most of the posts were done in collaboration with a wallpaper company, meaning the company provided the material to the blogger for free in exchange for a blog post. As noticed in one of the benchmark interviews (company B3) and one of the business customer interviews (company C2), collaboration with bloggers is a vital marketing channel for the companies. Thus, the bloggers might have an interest to please the company providing the material, and to write positive posts or leave out the posts if they have negative experiences of the product. Further, little comments were given by the users to the blog posts. Even though the blogs did not offer insights to this study, they could prove out useful somewhere else, for instance scouting new competing products or trends in decoration.

The interactive feature conceptualisation revealed new information that was not reached with the first two. The method provided new understanding on the user's private lives, and preferences in decoration. Also, the meanings of the wallpaper, as well as memories, dreams and emotions related to the wallpaper were probed. The method revealed spontaneous thoughts, especially in the interviews that took longer than one hour. When there was no feeling of hurry, the user could relax, memorize, and express freely her thoughts.

It is important, that the interviewees are selected carefully, but finding the suitable users can be difficult for a company that does not naturally possess a contact to the consumers. The interactive feature conceptualisation was the most time consuming

method, because it required travelling to the user's home or office. This method could be made more lightweight by either reducing the number of interviews or making the interviews with a video call so that the user can show her facilities through a webcam.

The following table 9 summarises these advantages and disadvantages of the three methods. Considerable advantages are marked with (++), moderate advantages with (+), considerable disadvantages with (--), and moderate disadvantages with (-).

Table 9. Advantages and disadvantages of the user research methods applied.

Business customer interviews	Netnography, online customer review site	Interactive feature conceptualisation
Contextual understanding of business (++)	High number of answers (enables statistical analysis; improves trustworthiness) (++)	Discussion on personal experiences (++)
The contact to many business customers is already established (++)	Data accessible anywhere and anytime (++)	Spontaneous answers, memorizing, and expression of feelings and thoughts (++)
Possibility to ask more details (+)	Fairly fast: 3h for analysing the reviews of one company from past one year (+)	Possibility to ask more details (+)
The business customers were eager to help and discuss (+)	Content is not biased by interview questions, and the users' thoughts are natural (+)	Can be run by video conference (user can show around the house) (+)
Time consuming: 2,5-3h per interview (including preparation, interview, analysis) (in real life, this would be done simultaneously in business meetings) (--)	Information from several countries (+)	Possibility to do as a follow-up interview of a longer study (+)
No personal stories, experiences (-)	A few detailed comments about the service experience, and description of the whole process (+)	Time consuming: 2,5-5h per interview (including preparation, travelling, interview, analysis) (--)
A lot of the content is known already from previous business meetings (-)	Insights restricted to short comments, which possess a risk for superficial information (--)	Suitable users are hard to find for interview (-)
Requires sensitivity because of the business relationship (-)	Use of content restricted by terms and conditions of the service (--)	
	Impossible to ask more details (--)	

5.2.2 Nature of findings

In the literature review, the methods were classified according to the type of knowledge they produce. When comparing the results to Hanington's (2003) model, the business customer interviews, and the netnography on the online customer review site produced most generalisable and statistical information. The generalisable understanding from the business customer interviews was about the general process of procurement, the trends in wallcoverings, and what kinds of images the consumers prefer printing. The generalisable findings from the online customer review site was lists about problems in installation and the service, valued product and service qualities, spaces decorated, and images chosen.

From the observational aspect, the netnographic research helped to understand in general what kind of people the customers interested in this kind of custom wallpaper are. Additionally, the topics the customers commented, were considered to be the ones they considered the most important in the service (e.g. fast delivery, personal end result, and clarity of the image).

The interactive feature conceptualisation produced the most analytical information. The method explained the reasoning why they had chosen a certain image, how the custom wallpaper affects their feeling in the space, and what they pursued in decoration in general. This method provided also the most visual material, because the wallpaper was shown in the real space, where it was installed or planned to be installed. Additionally, visual inspiration material was used in the discussions, and the categorisation of the sticky notes formed a visual understanding of the whole. This method succeeded in helping the users to articulate their latent thoughts and values, which is the aim of the make methods (Sanders and Dandavate, 1999). This was demonstrated by the comments from two of the users who said they had never not thought of the wallpaper and decoration as deeply before. The following table 10 summarises, what kinds of aspects and topics were uncovered with the methods.

Table 10. Nature of findings the user research methods produced.

Business customer interviews	Netnography, online customer review site	Interactive feature conceptualisation
Numbers for which pictures customers print	Problems in installation	Reason why one user chose another product
Trends in wallpapers	Reasons for reclamation	Reasons why users hired a professional for installation
Process of ordering, producing and delivering the product	Satisfied and dissatisfied comments about service	Decision making process of the user when choosing the wallpaper and picture
Understanding the touch points between the digital printing company and the customer	Aspects the customers value in the service (e.g. delivery time)	Stories, memories and meanings behind the chosen pictures
Marketing channels the company uses	Perceived product quality	Interiors of house and personality of the user (context of use and daily life)
Understanding the business area as a whole	List of spaces decorated	Motivation and drivers in decoration
Technical knowledge about materials	List of images chosen for the wallpaper	Information on substitute products
	Understanding the general customer profile	Images of the results, and seeing installed wallpaper live at the user's home or office

5.2.3 Value of the new user research for focal company A

The results of the new user research were in general new and valuable for the focal company A. The expectations for the end user research were discussed during the interviews at the focal company A. One of the expectations was that the end user research would bring new ideas how to sell and market the product. Also the company A was interested to hear whether the research material would support or conflict with the assumptions of the user needs they had made earlier in the project.

The first method, the business customer interviews, focused on describing the business operations of the companies C1 and C2, and how they collaborate with their customers. Therefore these findings were focused on opportunities to enhance the collaboration, and ways to communicate the product benefits to the consumer through the business customer. One of the new ideas was to collaboratively advertise

the Digital Wallcovering product in consumer channels, like in decoration magazine, website or consumer fair.

The findings of second method, netnography on an online customer review site, focused on new understanding on the whole service of producing custom wallpapers, and what the end users valued there the most. The qualities mentioned in most reviews included good quality, fast delivery, good customer service, easy installation, and reasonable pricing. The easy installation was one of the presumptions the focal company A had made of the user needs, and was thus confirmed. The focal company A should go through also the rest of the qualities and analyse, how they could affect these qualities of the service, and enhance their own business to support that. Taking the reasonable price as an example, the company A should aim at reducing the amount of middle men in their value chain, because the price of a wallcovering product increases proportionally in every step of the value chain. Therefore the price of the final product sold to the end user might become twice or three times higher compared to a traditional wallpaper material.

The third method, interactive feature conceptualisation, revealed reasons for and against purchasing the custom wallpaper. These findings did not provide the company with suggestions of simple actions, but rather encouraged them to communicate the qualities of their product more strongly. For example the users were hesitant to decide on the right pattern because the decision needed to be long lasting - once the wallpaper is installed, it will be on the wall for several years. Therefore the focal company A should emphasize that the wallcovering material is not only easy to install but also easy to remove and it does not do harm to the wall. These findings further confirmed the presumptions of the user needs, but also revealed new valuable understanding on the purchase influencers.

The findings the focal company A valued the most are summarised in the following table 11.

Table 11. Key findings of new user research for the focal company A.

Business customer interviews	Netnography, online customer review site	User interviews & interactive feature conceptualisation
The business customer C1 found it valuable to have a good instruction video about the installation of the paper. The focal company A has uploaded a commercial video about the Digital Wallcovering online. They could also produce a step-by-step instruction video directed at end users, and the business customer could provide this to their customers.	Fast delivery of the product was mentioned in several customer reviews as a positive feature of the service. Therefore it is important for the focal company A that their business customers are fairly small and capable of delivering fast. If the retailer was a large company delivering fast, the company A could not produce the material on a required pace since they had limited storage resources.	The users considered it essential that each sheet was installed straight, and therefore were hesitant to apply the paper by themselves. None of the four users interviewed would have done the installation by themselves. Thus the company A should emphasize the easy installation of the product, and that it would save them the costs of using a professional.
The focal company A could do more collaboration with the business customer to create demand towards the consumer market. For instance, the company A could advertise the easy installation of the wallcovering in consumer channels and provide information about the retailers.	The price was considered decent or a little too high, and many customers might decide not to purchase the product if the price was too high. The price of the finalised product will raise proportionally to the acquisition price, and in order to keep it low the company A should aim at eliminating the amount of middle men in their value chain.	The users spend a lot of time deciding whether to purchase the wallpaper. One of the reasons was that it was considered expensive. Thus the company A should ensure the final price of their product will not get too high. Also with the help of the business customer, the company A should communicate how big an effect the product can have with the fairly low price.
	The good quality of the paper was mentioned in most of the comments, and especially because the paper was thick. Therefore the company A could easily promote their product by communicating more strongly their paper is thick, smoothing the roughness and shades of the wall.	Another reason, why it took long to decide on purchasing the product, was the difficulty to decide on the right pattern. This hesitation could be lowered by providing the users with inspiration. Also it should be emphasized the product is easy to remove, it doesn't harm the wall, and therefore the product is easy to change if the pattern gets boring over time.

	Several users were surprised of the good quality of the end result, and the easiness of the installation. This made the user group even more clear: users who cannot afford an expensive professional to do the papering but want to invest in personality in decoration and some extravagances. The easy installation should be emphasized in the marketing of the Digital Wallcovering product.	The good quality of the paper was mentioned important by a user, who considered it essential that the paper is thick enough to smoothen the roughness of the wall so he did not need to do the extra work to smoothen it before installation. This quality should be communicated more strongly by the company A too.
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5.3 Conclusion

The fifth chapter explained the course of the new user research done for the Digital Wallcovering case. The methods chosen to be applied were business customer interviews, netnographic research in an online customer review site, and interactive feature conceptualisation. These three methods represented a good variance of methods, and represented all three categories of say, do and make tools. The nature of the findings the methods produced were varied, as well as the value of the findings to the focal company A.

Much of the findings were already familiar to the focal company A, especially the findings from the business customer interviews. The most appealing of the methods was the netnographic research on the online customer review site, since it produced valuable information but didn't require much time or special expertise. The most complex and time consuming of the methods was the interactive feature conceptualisation, but it also revealed the most of the user's latent needs in decoration, and the meanings of the custom wallpaper for them.

In summary, the new user research brought valuable insights to the focal company A, even though the product had already been commercialized. The research gave the company ideas what aspects of the product should be highlighted in the marketing, and what kind of additional material and services they could provide to make the product more appealing. Further, new understanding on the pricing and competitor products were discovered.

6 DISCUSSION

The literature and empirical research yielded a great amount of material about interacting with users and customers in commercialization. The findings are discussed in this chapter, and clarified by answering to the research questions. Based on the findings, a new model to illustrate the value of user and customer interaction in commercialization is presented. In addition, an extended classification of the user research methods is suggested to complement the current academic discussion. Managerial suggestions are given on interacting with users and customers in commercialization. Suggestions are given to further elaborate on the findings, and to evaluate their validity in other fields of businesses.

6.1 Synthesis of results

The literature and empirical research gave a lot of insights to the three research questions. Each research question is discussed one by one, and finally the research problem will be discussed.

Q1) What is the role of users and customers in innovation process?

How the terms user and customer are used in innovation process, tells about the role the users and customers are given in the company. In many cases the terms are used in parallel to talk about the same subject. The context and focus of discussion affects the choice of the term. When using the term user, the speaker is usually concerned about the experience evoked from the use of the product. The focus is in an individual person who has feelings and thoughts. When using the term customer, the speaker most likely considers the purchase of the product. The customer could mean an individual person, whereupon also the term consumer is used. The term customer is also used to talk about companies, in which case also the terms client and business customer is used.

In literature the term user is used in the fields of human research and design, whereas customer is more used in the management literature. A similar distinction was found in the empirical research as well. The interviewees selected the term according their in the company, and the type of the company's product. Design oriented companies were more likely to see a clear difference between user and customer, while technology oriented companies were more likely to use the terms alternately. In all of the companies, people who worked in the product development were using the term user to talk about the user or consumer of the final product.

When they used the term customer, they talked about the business customer, who purchased the product but did not use it. People who worked in sales, used the term customer to talk about everyone who was in touched with the product, including distributors, retailers, business customers, professionals and consumers. The people in marketing and innovation management used the terms alternately, but found it important to differentiate the roles in discussions inside the company.

If these terms are used ambiguously, and not defined in discussions, there is a risk of misunderstandings. It is advisable to use the term of natural language, and choose the term that is most used by the representatives in the discussion. Even when talking about the same subject, it can be beneficial to change the term according to the context (Iv_E_1). If the discussion is clearly about issues related to usability, use context, or experience, it can be beneficial to use the term user. The term user has a tone that directs the discussion to an individual as a living and feeling person. If the discussion is more about things like market demand, sales, or customer service, it makes more sense to talk about customers. The term customer directs the discussion towards people or companies that need to be satisfied in order to be successful in the business.

Because of the varied use of the terms in literature and in the companies studied, the terms user and customer were considered equally important in this thesis, and it made no sense to omit one or the other. Therefore both terms were taken into discussion when exploring the value of interaction with users and customers in commercialization. Yet, when talking about the interaction with the users and customers, the focus was set in the individual human beings who bought and used the final products. In other words, the the focus was not in the interaction with business customers, including other companies, distributors and retailers.

Q2) What kind of value could new user research bring in commercialization?

The value of user and customer interaction for product success is unquestionable. If the product has no need in the market, the value of the product becomes obsolete. In addition to this, the literature and empirical research arose several other reasons why interacting with users and customers is valuable in commercialization. The recognised values are classified in the Value Wheel (figure 11) according to the theme of the value. The recognised themes include demand and purchase behaviour, sales, marketing, positioning and new business opportunities, improving the product, increased understanding, customer relationships, and general good. In the Value Wheel (figure 11) each value has a mark of the source where the value was mentioned, meaning literature, benchmark company interviews, focal company interviews, or the new user research. This clarifies, what kind of values were found in each source, and which of the values were supported by several sources.

In general, all the sources could provide input for almost all of the themes. The most general values were recognised in the literature, because they have been recognised

several previous studies, and are generalised to understand the phenomena on a universal level. On the contrary, the new user research gave the most practical understanding on the type of information needed to improve for instance the marketing or enhancing the sales meetings. This information included insights of the qualities the users value in the product, meaning of the final result to the user, and pain points that make the user hesitate in the decision making. The values recognised in the focal and benchmark company interviews were specific to their own business field, and they both supported the values from the literature, but also broadened the variety of values.

Altogether from all sources, the most values recognised were related to the theme of positioning and recognising new business opportunities. All the sources of information confirmed that new user and customer research in commercialization helps to validate the previously defined user needs, to foresee new ones, and to react if the needs have changed. Additionally the themes of marketing and sales received a great deal of input from all the sources of information. Here the value of finding good product arguments to be used in sales meetings was highlighted in the empirical research. The literature did not raise this value. The reason could be that finding the right marketing arguments is considered as part of the product positioning, and therefore it is not mentioned separately.

Literature was the only one to mention aspects of improving the product, either through early customer feedback (Hoyer, et.al, 2010; Prahalad and Ramaswamy, 2010) or feedback from pioneering users (Jespersen, 2010). This theme did not arise from the empirical research. In the benchmark companies the feedback for developing the product qualities and functionality was gathered during the product development phase. During commercialization, the feedback asked from customers was focused in finding good arguments for sales and marketing. The spontaneous feedback from the users and customers was related to issues in the whole procurement process, or installing the product, but not specifically about issues in the product qualities.

Interestingly, none of the three benchmark companies raised the value of understanding purchase behaviour, the influencers of purchase decision, or the market demand. These aspects were recognised in the literature, focal company interviews, and the new user research. One of the reasons could be that the benchmark companies operated mainly with their business customers, and therefore focused on sales situations with them. One of the benchmark companies produced material products for the consumer market, and they were interested in promoting the attractiveness of the product. This of course needs to consider the overall market demand for the product, and therefore the theme was present in the interviews with them, but it was not specifically named.

Most of the recognised values were related to direct business value, but also some soft values that could not be directly translated into business potential were

recognised in all of the sources. These included the themes of customer relationships, general good, and increased understanding. The focal and benchmark companies valued the increased understanding of the user's world and thinking, the meaning of the product to the user, their problems in the whole procurement process the product is part of, and the overall context of use. These aspects help the companies to see beyond their domain. Affirming customer relationship was recognised important in the benchmark interviews, and the literature. Doing general good was considered valuable in one of the benchmark companies. This meant affecting the everyday life of people and being of help to their customers. This is an aspect that makes the work of the employees feel meaningful, and can therefore improve their performance in serving their customers.

In the literature review some benefits of doing empathic research in commercialization were recognised. One of the benefits was helping the sales people to foresee the customer's individual situation and needs, and potentially to prepare acting on them and evoking the desired emotions. This finding was supported in the benchmark interviews, as one of the benchmark companies interacted closely with the end customers, visiting their homes and learning about their desires and fears related to the whole procurement project. The company systematically collected this information from sales meetings, to help the other salespeople to prepare for future sales meetings.

The Value Wheel (figure 11) clarifies the different types of value the company can receive from interacting with their users and customers in the commercialization phase. This model can be useful for companies to evaluate whether they would need to interact more with the end users and customers of their new product, and what kind of value they could gain. Understanding the potential value helps to plan the user research, form research goals, and to select applicable approaches.

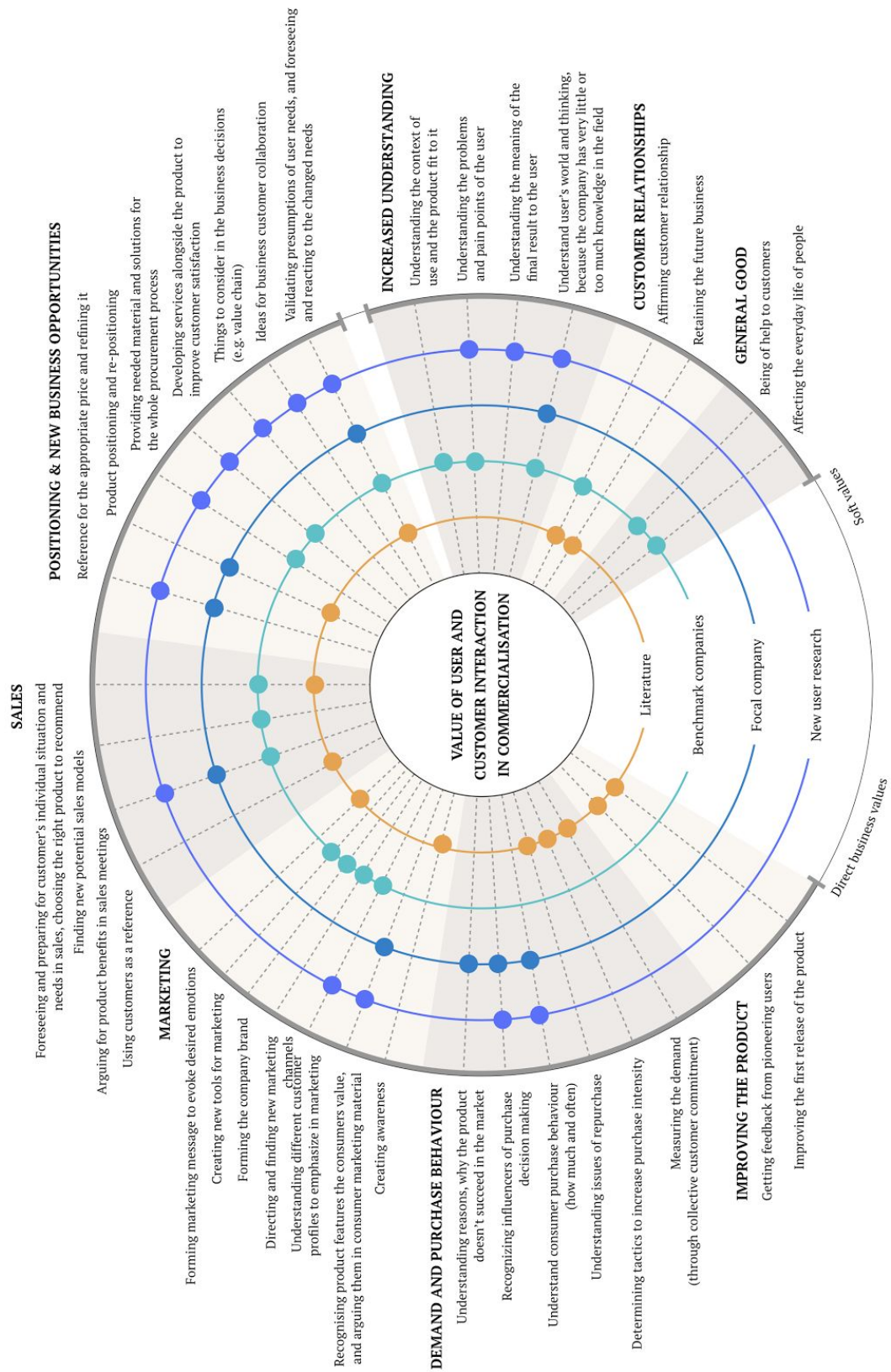


Figure 11. Value Wheel of user and customer interaction in commercialization.

Q3) How should users be studied in commercialization? Which approaches should be applied to the focal company case?

When learning from users and customers, the literature uses the terms interaction and research. The term interaction has a more broad meaning than research. Interaction can happen in informal encounters, but it does not exclude purposeful research activities. The focal and benchmark companies considered both the informal encounters and the purposeful research valuable for learning from their users and customers. Thus the term user and customer interaction was used during this study to refer to both types interaction between a company and its users and customers. To talk specifically about purposeful research, the term user and customer research was used.

Interacting with users and customers should not be limited to some specific phase of the innovation process. The literature could not provide a clear definition which are the phases, where the interaction should or should not happen. Similarly, the empirical research could not specify why the interaction should happen in some particular phase. Therefore it is recommended to interact with users and customers throughout the innovation process. It is rather dangerous for the product success, if the user and customer understanding is forgotten in some phase of the process, and the changing conditions in the market are not recognised.

The literature gave good general guidelines for conducting user and customer research. In order to achieve a comprehensive and empathic understanding on the users and customers, a varied set of methods should be used. Methods from three categories should be applied: what people say, what they do, and what they feel and dream. When choosing the methods, the company should consider the following questions: 1) what information is needed (for the project and the whole company), 2) which resources are available (know-how, tools, time and money), 3) which methods and capabilities can be applied or created, 4) what is the maturity of the technology, and 5) how similar the new users are from the current users.

As learned from the literature, the methods usually applied to commercialization represent the traditional market research methods. These have been recognised to have several limitations, including the poor representation of reality and future, and the lack of understanding of user's emotions, thoughts and desired experiences. These aspects have been studied in the design research through creative and participatory methods, and could thus be useful for complementing the limitations of traditional market research.

The research done at the benchmark companies and the focal company also concluded with recommendations for doing user and customer research, and utilising the knowledge. These included recommendations for doing enough user research with diverse methods, learning about personal lives of the users. These recommendations supported the conclusions of the literature research. Further the focal and benchmark companies recommended to share the same definition of user

and customer in discussions, to share the knowledge between the departments effectively, as well as to discuss about the business decisions together with the departments. These were recommendations the companies considered valuable for utilising the understanding effectively.

The methods used in the new user research proved to be applicable in the Digital Wallcovering case, and to provide the focal company with new valuable knowledge. The amount previous user and customer knowledge in the case was slight, and therefore the case would likely benefit from doing more research using any method. Of the three methods applied, the netnographic research on the online customer review site seemed to be the most applicable one for the Digital Wallcovering case. The method produced a lot of insights with ease. The business customer interviews produced only little new knowledge, but it was also an easy method to apply. The most valuable new knowledge was derived from the interactive feature conceptualisation, but the method would require the company to learn new skills. The interactive feature conceptualisation was also the most time consuming, but once the method is taken into use, it could be used more efficiently.

Could product commercialization be supported with user understanding derived from new user research?

Based on the findings to the three research questions, it is evident that new user understanding provides value for the commercialization phase. More specifically, benefits of doing new user research were recognised, and recommendations for choosing the approaches and using the knowledge effectively were drawn. The details how the literature and empirical research answered to the three research questions can be found in the appendix E.

6.2 Theoretical implications and suggestions for future research

The research brought the discussions of the user research and commercialization closer to each other. These topics have not been discussed much together in previous literature, and user research has been discussed mostly in the front end of innovation and product development phases (e.g. Hanington 2003; Koskinen. 2003). This research showed up benefits of conducting user research in commercialization, and recommendations for doing the research, in the context of industrial companies.

The Value Wheel (figure 11) presented in the previous chapter 6.1 classifies the perceived values of user and customer interaction in commercialization that were derived from literature and empirical research. These values are discussed in the literature, but the findings are scattered, and no comprehensive analysis on the topic has been made. The empirical research gave new examples of the value the user and customer interaction can provide. As demonstrated in the Value Wheel, the empirical research supported and added to the findings of the literature, but also neglected some of the values discussed in the literature. The Value Wheel classifies the values in themes to show what different kinds of value a company can seek for. Understanding the variety of values can help a company to evaluate what kind of

value they could gain from user and customer interaction in commercialization, and to encourage the company to conduct more user research.

Based on the findings of this research, an extension to Hanington's (2003) classification of the user research methods is suggested. In Hanington's (2003) model the methods are classified according to the type of knowledge the methods produce (see chapter 2.3.1). The extended model uses the same basis, classifying the models according to the type of knowledge, but also according to whether users are involved directly or indirectly. The need for this extended model is to show that the company can use participatory and creative methods that do not involve the users directly, and still reach useful information on the topic. The methods the benchmark companies used, including mystery shopping, and using the product by oneself, gave the company great insights to the user's viewpoint the company could not have reached through traditional market research methods. These methods do not promise an empathic understanding between the researcher and the user, since it still requires direct interaction with the users (Koskinen, 2003).

In Hanington's (2003) model it is questionable whether these methods, e.g. mystery shopping and using the product by oneself, should be classified as traditional methods or as participatory and creative. On one hand, these methods are participatory in sense that they required the company people to act as users, and to explore the world from the user's viewpoint. On the other hand, these did not include direct interaction with the real users as the participatory methods should (Hanington, 2003). In the extended classification the methods have a clear position in the classification - as participatory but not involving users directly.

The extended classification (figure 12) includes only methods that appeared during the empirical research, and therefore it has a strong focus in commercialization. Only these methods were included because the empirical research provided good insight on how they were applied in commercialization. Thus, the applicability of the model in other phases of innovation process should be examined in future research. Further, the methods are classified according to the way they were applied in the companies studied. The methods should be positioned again, if the methods would for instance involve different people, or the research context was changed from company facilities to user's home. Therefore this classification of the methods should be considered approximate and not fixed.

The extended classification (figure 12) highlights that the most methods used in the studied companies represent the most surface level of knowledge on what people say. On the deepest level are only two methods that engaged real users, which is the prerequisite of empathic understanding (Koskinen, 2003). A few more participatory methods were used, but they did not involve users directly. Having the division of methods according to the level users are involved, makes it easier to evaluate, whether the method is truly engaging users, and leading to empathic understanding.

On the three vertical levels of explicit, observable, and tacit / latent, the methods are classified according to the type of knowledge they produce, similarly to Hanington's (2003) model. On the upper part the knowledge is generalisable, statistical, numerical and verbal. On the lower part, the knowledge is visual and verbal, and concerning content and patterns. On the horizontal level, the methods are divided into two columns according to the level of engagement of the users. On the left side, the methods involve users of the final product directly. On the right side, users are involved indirectly through for instance company representatives, business customers or retailers. Ever still, the methods can produce valuable although limited understanding of the end users.


DEPTH OF KNOWLEDGE (Visser, et.al. 2005)	TYPE OF KNOWLEDGE (Sanders and Dandavate, 1999; Hanington, 2003)	KNOWLEDGE ABOUT (Sanders and Dandavate, 1999)	RESEARCH TECHNIQUES WITH DIRECT USER INTERACTION	RESEARCH TECHNIQUES WITH INDIRECT USER INTERACTION
 SURFACE	EXPLICIT	SAY & THINK	Neurological studies Online consumer profile test Focus groups Feedback questionnaires Customer call center	Sales discussions with business customer Business customer interviews Sales figure analysis Tracking website behaviour Trend research Visiting consumer fairs
	OBSERVABLE	DO & USE	Observation at field Videorecording of usage Test use the product by oneself Testing the product at user's home Netnographic research	"Agents" studying the field
	TACIT & LATENT	KNOW, FEEL & DREAM	Video diaries Evenings for professionals Interactive feature conceptualisation	Company internal workshops Mystery shopping Procure and use the product by oneself
DEEP	Visual + verbal Analytical (patterns + affinities)			

Figure 12. Extended classification of user and customer research methods.

This study showed that the type of knowledge the methods produce is dependent on whether the users are involved directly or indirectly. The extended classification was

concluded from the findings of the literature and empirical research, but its validity should be tested in future product innovation cases. Additionally, the phenomena was noticed along the commercialization of products in the context of industrial companies. Further studies would be needed to validate the applicability of the classification in other fields of business, and in other phases of the innovation process.

The findings from the literature and empirical research showed that user interaction is relevant for commercialization. The topic has not been extensively studied in literature, and therefore more studies is needed. More cases of product commercialization should be studied, in order to validate the relevance of the Value Wheel (figure 11), and to further build on it. This study was not able to follow how the new user research affected the success of the Digital Wallcovering case. Therefore further research is needed to investigate the effects of new user research in commercialization. Also the recommendations for utilising the user understanding efficiently was given only slight attention in this study. Therefore it is recommended to do more studies to focus specifically on that topic. Furthermore, the relevance of the topic should also be validated in other fields of business.

6.3 Managerial implications

The managerial implications of this study are twofold. Firstly, this study gave recommendations for the focal company A on conducting user research in the commercialization phase of the Digital Wallcovering product. Specifically, the focal company A should increase the level of interaction with the end users of the product, use a diverse set of approaches to study them, define clearly the roles of user and customer in their discussions, and enhance the sharing of the user understanding inside the company. As an added advantage from this study, the focal company A received valuable new understanding of the end users of the digitally printed custom wallpaper.

Secondly, this study gave useful understanding for any other company on why and how to interact with users and customer in commercialization. As one of the most important benefits of user and customer interaction, it helps the company to notice the changed conditions in the market, and to act accordingly. Therefore users and customers should be interacted with throughout the innovation process, and not forgotten even in the commercialization phase. The Value Wheel (figure 11) is helpful for evaluating what kind of value the user and customer interaction can provide for a company. This helps companies to plan new user research, define research goals, and to choose applicable approaches.

To select applicable approaches, the recommendations from this study should be considered. It is recommended to include methods from all three levels of what people say, what they do, and what they dream and feel. This leads to a comprehensive and empathic understanding of the users. Further, when selecting the methods, the company should consider what information is needed, what

resources are available, what methods and capabilities can be applied, and what is the maturity of the technology, and the familiarity of the new users. The classification of user research methods (figure 12) helps to evaluate what kind of information can be achieved with methods the companies already use, and what kinds of new methods the companies should adopt.

The empirical research done at the focal and benchmark companies concluded with valuable recommendations for utilising the user understanding efficiently. These recommendations include sharing the same definition of user and customer in discussions, sharing the knowledge between the departments effectively, and discussing together about the business decisions. Also interacting with all players in the value chain is beneficial, as the business customers, retailers, distributors and other business partners possess valuable information. This can add to the comprehensive understanding of the users, and it can yield ideas for new potential business and collaboration.

6.4 Limitations

The time frame of this thesis was only six months, and therefore the scope of the study was kept tight. The findings of the study were drawn from the field of industrial companies, and their accuracy in other fields of business cannot be justified without future research.

For the short time frame, the research done at the benchmark companies needed to allow the inspection of the whole innovation process, and focusing solely in commercialization was not possible. Separating the commercialization phase of their projects plausibly was not possible during the time of one interview. To achieve this, more interviews with various people involved in a specific case, and a follow-up on the case would have been needed. The credibility of the findings from the literature and the benchmark companies was supported with the follow-up on the Digital Wallcovering case at the focal company A, and doing diverse interviews with people who had been part of the project. Here, the commercialization phase of the Digital Wallcovering was easier to distinguish than in the benchmark companies, as the project was studied during a longer period of time. This one case showed the existence of the recognised results, but to ensure the reliability of the results, more cases should be followed in other companies.

Comparing the results of the new user research to the existing knowledge in the focal company was limited to the insights from the interviews. Further, the time frame of the study was not enough to follow, whether the new user understanding was utilised in future actions in the Digital Wallcovering case, or to see if the new actions affected the success of the product. A trustworthy evaluation of the results would have needed a longer time frame, precise information on revenue figures, and access to the material of the original market research and focus group sessions.

While conducting the new user research, the most considerable limitation was that the research was done by the researcher, and not by the company representatives.

Therefore the applicability of the methods could only be evaluated based on the understanding from the interviews. To see what kinds of challenges the new practices would have caused in the company, a dedicated person from the company would have been needed to learn using the methods, and to conduct the research. Had someone from the company done the research, also the findings of the research could have been different, and the findings could have been interpreted differently. The findings from the business customer interviews were likely to have been different, because the company had a relationship with the business customers from a long time ago.

7 CONCLUSION

This study focused on exploring whether new user understanding is beneficial during the commercialization phase of products. Specifically, this topic was explored through three research questions: 1) What is the role of users and customers in innovation process? 2) What kind of value could new user research bring in commercialization? and 3) How should users be studied in commercialization, and which approaches should be applied to the focal company case? This topic is not explored extensively in the previous literature.

Understanding the customer needs is recognised as one of the most important factors for successful products. Conducting new user and customer research is most discussed in the front end of innovation, and the product development phases. In commercialization the effect of user and customer interaction is believed to be lower than in other phases, because the product cannot be changed anymore. However, a lot of reasons why user research is valuable in commercialization are recognised in the literature, but the discussion is scattered. Usually the user and customer research in commercialization is done using traditional market research methods. These methods have limitations including the poor representation of reality and future, and the lack of understanding of the user's emotions, thoughts, and desired experiences. These aspects are suggested to be explored through methods that are participatory and creative.

The practices and value of conducting new user research in commercialization was explored in the empirical research. Three benchmark companies were studied to find out the reasons why they consider user understanding valuable, and to get recommendations how to interact with users efficiently. These learnings were further utilised at the focal company, to examine how the limited amount of user knowledge can have led to low financial performance of a newly launched product, and how new user understanding could benefit the project at this stage.

The empirical research confirmed that new user understanding can be valuable for a newly launched product. The recognised values were classified in a Value Wheel model to illustrate the different types of values a company can seek when conducting user research in commercialization. Eight themes of values were recognised: 1) improving the product, 2) demand and purchase behaviour, 3) marketing, 4) sales, 5) positioning and recognising new business opportunities, 6) increased understanding, 7) customer relationships, and 8) general good.

Understanding the different types of values can help a company to evaluate what kind of value they could gain, to encourage the company to conduct more user research, and to plan new user research.

Recommendations for conducting user research, and utilising the user understanding were drawn together from the learnings of literature and empirical research. The company should aim for learning about personal lives of the users, and use a diverse set of methods from all three categories: what people say, do and feel and dream. When choosing the methods the company should consider what kind of knowledge it needs, what are the available resources, capabilities, and methods. In addition, it should be considered how different the new technology and the new customers are from the old ones. For effective use of the knowledge, the company should share the same definition of user and customer in discussions, share the knowledge between the departments, as well as discuss the business decisions together amongst the departments.

Both the literature and empirical research highlighted the importance of selecting a diverse set of methods. The methods for studying users and customers are classified by Hanington (2003) according to the type of knowledge they produce. On the deepest level of knowledge in Hanington's model are creative and participatory methods. The empirical research showed the companies use participatory methods, but they do not directly engage users, and therefore it is not clear how they should be classified in Hanington's model. This study suggests an extension to the model to divide these methods according to whether users are involved directly or indirectly. This allows recognition of participatory methods that do not engage users directly, but still produce valuable information, and deeper understanding than the methods of the most superficial level. This extension further highlights that true empathic understanding is reached only if users are interacted with directly.

In general, the previous research has discussed user interaction less in the commercialization than in the front end and product development phases, and therefore more studies should be done. The list of recognised benefits and recommendations of user interaction should be complemented with future cases of product commercialization. What is more, this study did not extend to study the effects of new user understanding on the success of the newly launched product, and therefore this is also suggested to be studied in future cases. Furthermore, the suggested extension of the classification of user research methods should be tested in future cases of product innovations, and see if the extended classification is applicable in the whole innovation process.

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8.2 References to interviews

Interviews at benchmark companies

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Iv_B1_2, 7.11.2014, User and customer research practices, Innovation management

Iv_B2_1, 6.11.2014, User and customer research practices, Sales

Iv_B2_2, 11.11.2014, User and customer research practices, Marketing and Innovation management

Iv_B3_1, 14.11.2014, User and customer research practices, Innovation management

Iv_B3_2, 17.12.2014, User and customer research practices, Marketing

Interviews at focal company A

Iv_A_1, (background material), Innovation processes at the company, Innovation management

Iv_A_2, (background material), Innovation processes at the company, Sales

Iv_A_3, (background material), Innovation processes at the company, Sales

Iv_A_4, (background material), Innovation processes at the company, Customer service

Iv_A_5, (background material), Subtracting and supply chain processes at the company, Logistics

Iv_A_6, (background material), Digital wallcovering project and innovation processes in general, Marketing

Iv_A_7, 3.11.2014, Digital wallcovering project and innovation processes in general, Sales department

Iv_A_8, 1.12.2014, Digital wallcovering project and innovation processes in general, Research and development

Iv_A_9, 16.12.2014, Digital wallcovering project and innovation processes in general, Research and development

Iv_A_10, 8.1.2015, Digital wallcovering project status, Sales department

Interviews with business customers

Iv_C1_1, 5.12.2014, Business and customers of the company, Professional markets

Iv_C2_1, 5.12.2014, Business and customers of the company, Consumer markets

Interviews with experts

Iv_E_1, 18.11.2014, User and customer research practices in manufacturing B2B companies, Senior post doctoral researcher

Interviews with end users

Iv_U_1, 3.2.2015, Custom wallpaper acquired to user's home

Iv_U_2, 6.2.2015, Custom wallpaper not yet acquired to user's home

Iv_U_3, 26.2.2015, Custom wallpaper acquired to company office

Iv_U_4, 7.3.2015, Custom wallpaper acquired to user's home

APPENDIX

Appendix A1: Interview structure for interviews at benchmark companies (in Finnish)

Taustatiedot:

- Kauanko olet ollut firmassa?
- Millaisissa tehtävissä tai projekteissa olet ollut?
 - Ovatko nämä yleisiä projekteja vai liittyvätkö yksittäiseen tuotteeseen?
 - Ovatko tuotteet uusia vai kehitätkö olemassa olevia tuotteita?
 - Mitkä ovat hankkeen lähtökohdat, miten tarve uudelle tuotteelle havaitaan?
- Millainen tyypillinen työpäiväsi?
- Kenen kanssa teet töitä?

Käyttäjätutkimus:

- Onko mielekästä puhua erikseen asiakkaasta ja käyttäjästä?
 - Mitä näillä on mielestäsi eroa?
 - Ketkä ovat pääasialliset asiakasryhmät?
 - Mikä on arvoketju yrityksestä loppuasiakkaaseen?
- Huomioidaanko käyttäjät ja asiakkaat projekteissa?
 - Missä vaiheissa käyttäjät ovat mukana?
 - Mitkä ovat kontaktipisteet käyttäjän kanssa?
- Mistä ja miten saadaan tietoa?
 - Miksi asiakkaita ja käyttäjiä osallistetaan tietyllä tavalla?
 - Kokeillaanko uusia tapoja?
- Millaista käyttäjätietoa saatte?
 - Kerro jokin esimerkkituote, mitä käyttäjistä tiedetään.
 - Ovatko laadulliset asiat, kuten käyttökokemus tai käyttäjän elämä kiinnostavaa tietoa?
 - Millaista tietoa on vaikea saada? Mistä tämä johtuu ja mikä esteenä?
 - Millainen tieto on luotettavaa ja riittävää?
 - Onko eri markkina-alueiden välillä eroja?
- Miten käyttäjät ja asiakkaat ovat virallisesti osa innovaatioprosessia?
- Miten tietoa analysoidaan ja integroidaan?

- Mihin tietoa hyödynnetään?
- Kenelle tieto annetaan ja missä muodossa?
- Onko käyttäjien tutkimisessa haasteita?
 - Anna esimerkkejä käytännön tilanteista.
 - Tuottavatko nämä ongelmia projekteille?

Yhteistyö tiimien välillä:

- Miten teette yhteistyötä tuotekehityksen / myynnin ja markkinoinnin kanssa?
 - Ollaanko tuotekehityksessä mukana aktiivisesti vai antaako tuotekehitys tietopaketin myyntiorganisaatiolle?
 - Miten tietoa jaetaan ja integroidaan yhteen (esim. ideapankkeja, tapaamisia)?

Uusien tuotteiden kehittäminen:

- Miten saadaan ideoita uusiin tuotteisiin?
- Miten käyttäjäkokemus huomioidaan kokonaisuutena?
- Millaista materiaalia käyttäjille & asiakkaille tuotetaan?
- Miten digitaalinen markkinointi on osa toimintaa?
- Miten uusia tuotekonsepteja testataan?
 - Käytetäänkö testauksessa prototyyppijä tai muuta materiaalia?
 - Mitä testauksesta on hyötyä ja kenelle?

Lopuksi:

- Mitä käyttäjätiedosta on mielestäsi hyötyä?
- Vaikuttaako omakohtainen kokemus tuotteesta työhön?
- Onko jotakin, mitä en ole kysynyt tai jotakin, mitä haluat kysyä?

Kiitos ajastasi.

Appendix A2: Interview structure for interviews at focal company A

Background:

- How long have you been in the company, and in which positions have you been?
- What does a product development engineer / sales manager / etc. do?
- What kinds of projects have you been involved?
 - How many projects are you working on currently?
- How is your usual day at work?

Digital Wallcovering project process:

- Could you tell about the Digital Wallcovering project?
 - When did you come along in the project?

- Is the development still ongoing?
 - How many people are there in the project, who?
 - Previously, who were involved in the project, has the project changed?
 - Is the R&D still involved in the project?
 - What are the next steps in the project?
- Is this somehow an exceptional project, in terms of size, or other?
 - How big is the project?
- How would you describe the process? What has happened in the project?
 - How did the project start, where did the idea come from?
 - Usually, where do the ideas come from (e.g. business case, competitor product analysis, technical improvement)?
- Who are involved in the early parts?
 - When do sales and marketing get involved? When does the production? If late, why only then?
 - We've heard about some cases where there has been production problems early on, is this usual?
- Is this somehow related to the other wallcovering products?
- Do you think the project has been successful?
 - If not, what is the problem? What challenges are there (e.g. price)?

Users and customers in Digital Wallcovering:

- Is it relevant for your work to talk about users and customers separately?
 - What is the difference?
 - What are the customer segments and user groups of the product (especially DIY vs. professional market)?
 - How have these segments been selected?
- Did you have information about the users and customers when developing the product?
 - What kind of information did you have?
 - Are you interested in qualitative understanding (e.g. experience in installation, meaning of custom wallcovering in decoration, stories)?
 - How did you get the information?
 - Do you now need some user information? Who would you like to know better?
- Before launch, did you test different versions of the product? Did you receive feedback from customers?
- After launch, have you received feedback (e.g. from sample rolls)?
- What is the most important thing in Digital Wallcovering that interests the customers, and differentiates the product from the competitors?

Users and customers in general in the company:

- Do you get user and customer information to your projects (in general)?
 - What kind of information is it (e.g. competitors, trends, use context)?

- In what kinds of projects do you usually have good information? In which ones do you have insufficient information? What is the reason for the difference?
- How do you get the information? What kinds of methods do you use?
 - Who receives the information (users, customers, product development, sales)? Is the information produced inhouse or outsourced?
 - Who are the users and customers you study (e.g. end users, business customers, whole market)?
 - In what format do you receive the information (e.g. interviews, presentation slides, emails, prototypes)?
- How do you put the information into use?
 - How is the information delivered to other departments? Do the others need the information, who?
 - How do you communicate the understanding?
 - Do the other departments do user studies?
 - How does the information affect the project and decision making?
 - Are there official guidelines on how users and customers should be part of development projects?

Users and customers in sales activities:

- If you have used the product yourself, how does the experience effect in selling it?
- Do you use prototypes in demonstrating a new product in business customer meetings?
 - What kinds of prototypes or artefacts do you have?
 - Are they useful? How?
- Do you utilise digital marketing in acquiring new information?
 - Is there someone in the company who uses it?
 - What kind of advantage can it provide?
 - Would it be possible to use it? What kinds of challenges could there be?

Thank you for your time.

Appendix A3: Interview structure for business customer interviews

Background:

- How long have you been in the company, and in which positions have you been?
 - What responsibilities do you have?
- What is your usual day at work like?
- With whom are you working together on a daily basis?

Users and customers in the business:

- Is it relevant for your work to talk about users and customers separately?
 - What is the difference?
- Who are the main customer segments?
 - How do you know your main customers? How have you defined them?
 - With whom do you usually associate, DIY's or professionals?
 - Have the customer segments changed? Is there a need for change?
- Customer journey: what happens when a customer plans the purchase?
 - How long does the interaction with the customer last?
 - Do you have repeating customers?
- The picture can be chosen in different ways.
 - How do you know which method for choosing the picture you should promote? Which one is the most popular among customers?
 - Is any motifs ever removed from the collection?
 - How do you define the categories (are they trends)?
 - What do people print if they choose own picture? Are desires homogenous, any examples?
- There are different set of pictures for different countries.
 - Do you study the preferences people have in different countries?
 - Is there some national and international differences?
- What does the customer think when choosing the picture?
 - Are you interested in the experience the customer has about the product?
 - How does the picture affect the decoration?
- Do customers need help in interior design, and designing how the wallpaper suits their decoration?
 - Do customers ask for trial prints, and do you give them?
- Do customers need help with installation?
 - Do you have installation partners?
 - Do you have some other partners to provide services?
- What is the most important thing in the wallpapers that interests the customers?
 - Is there a difference which type of wallpaper quality the customers prefer?
 - Are the customers interested in the wallpaper facts, like fire resistance, PVC free, or easy-to-hang? How do you know, do customers ask for those?

User and customer research:

- How do you get information what the customers want and need (e.g. interviews, observation, feedback, prototypes)?
 - Who are the customers you study?
 - What kind of information do you get?

- Do you get feedback through the customer service, third party reviews or website behaviour?
 - How do you utilise this information?
 - What kinds of things do customers ask for?
- You have a blog on your website.
 - How do you benefit from it?
 - Do you do collaboration with bloggers?
- Do you study your competitors on the market? How do you benchmark?
 - Which players do you see as your competitors?
 - Do you follow the trends of decoration market? How?
- How is the information delivered to other departments? Do the others need the information, who? (esp. between research and development, and sales and marketing departments)
 - How do you communicate the understanding? (e.g. with prototypes, or presentations)

Finally:

- Do you still develop new products?
 - Do you now need some new customer knowledge?
 - When developing or launching new product, do you test it or get feedback for it?
 - Do the customers give ideas or otherwise take part in idea creation?
- Why is customer knowledge important?
- Anything you would like to ask, or I have forgotten to ask?

Thank you for your time.

Appendix A4: Interview structure for interviews with end users along interactive feature conceptualisation approach (in Finnish)

Taustakysymykset:

- Millaisessa kodissa asut tällä hetkellä?
 - Millaisissa kodeissa olet aikaisemmin asunut?
 - Millaiseen olet muuttamassa?
- Millainen on sisustuksesi? (kertoen kuvista tai katsomalla paikan päällä)

Sisustaminen:

- Kuvaile vapaasti, millä tavalla sisustat asuntoasi?
 - Suositko tiettyä tyyliä, materiaaleja, värejä?
 - Mikä ohjaa päätöksiäsi (esim. tunnelma, käytännöllisyys, tilantuntu, persoonallisuus, hinta, helppous, laatu)?
- Kuinka usein mietit kotisi sisustusta? Miksi usein tai harvoin?
 - Kuvaile tilannetta, kun viimeksi mietit sisustustasi?
- Oletko vielä miettinyt uuden asunnon sisustusta?

- Kerro, mitä tapahtui, kun aloit sisustaa asuntoasi (nykyinen tai uusi).
- Vaihdatko sisustusta muuttaessasi uuteen kotiin vai tuleeko edellisen asunnon sisustus mukana? Mitä muutat?
- Mitkä asiat jäävät sisustukseen, mitkä ovat sinulle tärkeitä?
- Mikä saa sinut hankkimaan tiettyjä sisustuselementtejä?
 - Teetko spontaaneja valintoja vai harkittuja?
 - Mistä saat inspiraatiota sisustukseen (esim. kiertelemällä kaupoissa, netistä, kaverilta, matkoilta)?
 - Jos olet nyt hankkimassa jotakin uutta sisustuselementtiä, mitä tekisit? Jos katsot netistä, voitko näyttää?

Tapetin hankkiminen:

- Millainen tilanne oli kotonasi, kun aloit suunnitella tapettia?
 - Mistä sait idean tapettiin?
 - Kerro, mitä tapahtui.
- Oletko valinnut jo kuosin?
 - Millainen kuosi, kuvaile?
 - Mistä hait inspiraatiota? Näytä, jos mahdollista.
 - Valitsitko kuosin itse? Auttoiko joku tai suositteliko joku sinulle tapettia?
- Mihin tapetti halutaan laittaa? Miksi juuri siihen?
- Miksi valitsisit tapetin esim. maalaamisen tai taulun sijasta?
- Miten tapetti vaikuttaa muihin sisustuksen valintoihisi?
 - Valitsetko ensin tapetin ja sen mukaan muun sisustuksen vai toisin päin?
 - Haetko mieluummin ajatonta tapettia ja vaihtelevuutta sisustuksessa? Vai haetko yksinkertaista sisustusta ja pirteää tapettia?

Lisäkysymykset, kun tapetti on hankittu:

- Oletko tyytyväinen lopputulokseen tai oletko yllättynyt tai pettynyt?
 - Olisitko valmis muuttamaan tapettia?
- Mitä ajattelet, kun näet tapetin? Millaisissa tilanteissa näet sen? "Näetkö" sitä enää tai oletko tottunut siihen?

Tapetointi:

- Tapetoitko itse vai tapetoiko ammattilainen?
 - Mikä sai sinut valitsemaan ammattilaisen (esim. kustannus, ajankäyttö, omat kyvyt, vakuutus)?
 - Miksi halusit tapetoida itse? Teetkö yleensä itse käsilläsi ja mitä?
- Onko tapetoinnin helppoudella, ajankäytöllä tai lopputuloksella merkitystä?
 - Jos tietyllä kustannuserolla voisi valita tapetin joka on helpompi asentaa, mitä ajattelisit tapeteista ensimmäiseksi?

- Miten huomioit tapetin tekniset ominaisuudet (esim. paloturvallisuus, ympäristöystävällisyys, helppo pyyhkiä)?

Sisustaminen:

- Millainen koet olevasi sisustajana?
- Onko kodin sisustamisella sinulle merkitystä? Mitä sisustettu koti merkitsee sinulle, mitä se tuo sinulle?
 - Miten itse sisustettu koti vaikuttaa kotona viihtymiseen?
- Mitä sisustuksesi viestii?
 - Millainen tunnelma kodissasi on? Mistä se muodostuu?
- Vaikuttaako muiden mielipide sisustusvalintoihin (esim. perhe, vieraat)?
 - Onko heillä erilaisia mielipiteitä?
- Miten ystäväsi kuvailisi kotisi sisustusta?
- Millainen on unelmakotisi?
 - Mistä elementeistä se muodostuu?
 - Oletko nähnyt tuttavallasi sellaisen kodin vai oletko miettinyt itse?
 - Mikä estää toteuttamasta unelmakotiasi vai oletko jo toteuttanut?
 - Näyttäisitkö esimerkkejä?

Interactive feature conceptualisation -osuus:

- Merkitse kuhunkin lappuun, kuinka tärkeä se on asteikolla A B C. Siirrä sellaiset laput pois, jotka eivät ole tärkeitä. Voit lisätä uusia lappuja, jos jotain puuttuu.
- Jaottele laput kategorioihin ja anna niille otsikot.
- Puhu ääneen, mitä ajattelet.

Kiitos ajastasi.

Appendix B: The progress of Digital Wallcovering project

The steps of the Digital Wallcovering project until the time of this study had been as follows:

- Step 1 Initial market study
- Step 2 Technological scoping by consultancy company
- Step 3 First technical feasibility study at focal company A
- Step 4 Technological design phase
- Step 5 Validation and optimising the product for production
- Step 6 Defining the target market and demand creation campaign
- Step 7 Launch at a wallcovering exhibition
- Step 8 Optimising the product into version 2.0
- Step 9 Building customer base and contacting first pilot customers (state of the project at the time of this study)

Appendix C: Other possible reasons for Digital Wallcovering challenges

The challenges of the project explained in chapter 4.3 were drawn from the low user understanding during the project. In addition, three further potential reasons were recognised to explain the low financial performance and unfavourable situation of the project. Firstly, the ODI process was new to the company A, and therefore not yet fully embraced throughout the departments. New practices hold a greater risk of misunderstandings. Second, one of the interviewees (Iv_A_6) believed the sales department did not do proper follow up on the leads, and it was seen as one of the major risks for the success of the new product.

As the third potential reason, the departments had slightly different viewpoints of the competitive advantage the Digital Wallcovering offers. Both product development and sales departments believed that the most important feature for the end user is the easiness of applying it on the wall. For the sales department this feature was not enough to explain the competitive advantage. One of the additional benefits for the end customer is that the material does not leave any holes between the paper stripes. For the digital printers, the sales people believed that the benefit is the decreased amount of waste, because the roll can be left in the machine for the time it is not printing, without the material getting oxidized and unusable.

Appendix D1: Findings from netnographic research on online customer review site

Process. Reviews from Finland were analysed, altogether 325 reviews. First the reviews were printed out, and classified to see what kinds of categories are formed. The recognised categories were delivery, installation, quality, visual result, image or theme chosen, place, price, and canvas or wallpaper. The most insightful reviews were saved for inspiration. These reviews told for instance about the process of choosing a pattern, or about the problems the customers had during installation and how they were solved. Second, the reviews were analysed mathematically in a spreadsheet to count how many reviews discussed about each category, because one review could discuss about multiple categories. As an example, the formula for counting the categories was '=COUNTIF(D8:D324; "*laatu*")'.

Findings. The topics that were most discussed in the reviews included the good quality, fast delivery, good customer service, easy installation and reasonable price (see figure 13). This provides an answer to one of the things the focal company A was interested - what do the end users pay attention to in the final product, and the whole service of the Digital Wallcovering.

- **Quality** (mentioned in 46.8% of reviews) was considered good, and it was perceived through the material and the sharpness of the image.
- **Delivery** (mentioned in 44.9% of reviews) was considered fast, as the product was delivered with few days from order.

- **Customer service** (mentioned in 21.5% of reviews) was considered good and fast.
- **Installation** (mentioned in 17.8% of reviews) was mostly considered easy and fast, but also a lot of hesitance occurred.
- **Price** (mentioned in 8.9% of reviews) was considered good in terms of price-quality ratio. In a few reviews, the price was considered a little too expensive.

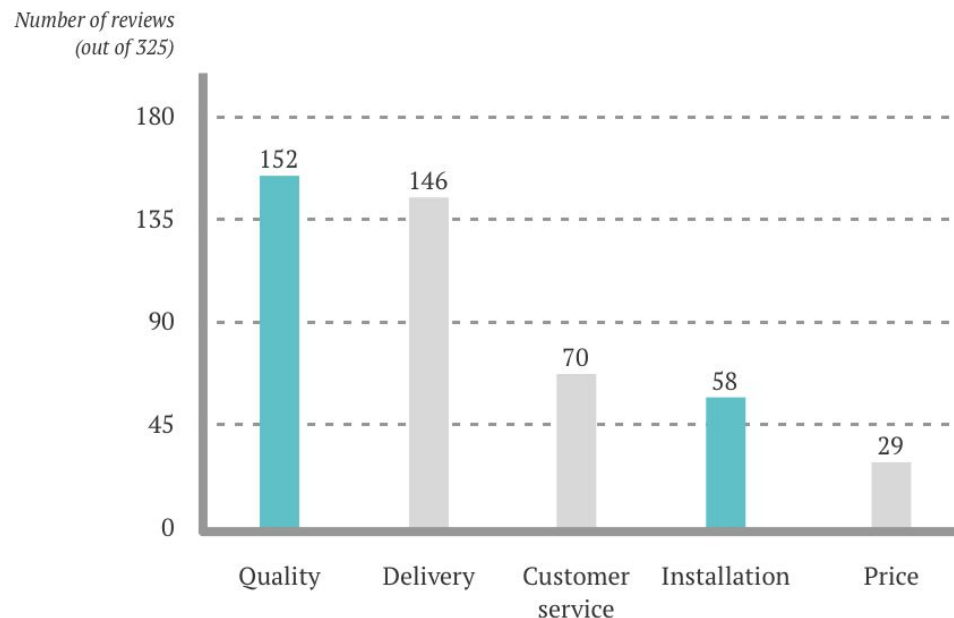


Figure 13. Findings from online customer review site analysis.

Appendix D2: Findings from research with interactive feature conceptualisation approach

Learnings from the interviews. The interviewees needed a little warm-up before starting the discussion about feelings or the meaningfulness of decoration. Therefore one hour is too little for an interview, and at least 1,5 hours should be reserved. Especially the sticky notes require half an hour at the end of the interview for the user to reflect on the discussion. It is important to think carefully, what is wanted from the interview. 1-1,5 hours is a very short time for invoking personal stories and insights, and therefore it's good to concentrate on the few very important questions.

Interviewing people about their homes yielded deeper discussions than interviewing about office surroundings. Running the interview at the interviewee's facilities (home or office) created a relaxed atmosphere, and it was easy for the interviewee to point at things, and to explain the thoughts and stories. It was insightful to see the wallpaper in its context, but the interviewee was also asked to describe the decoration and the wallpaper with their own words. This helped to understand the

context from the interviewee's viewpoint, rather than relying on the interviewer's perception.

Learnings from the sticky notes. Writing the keywords on sticky notes was found interesting by the interviewees. The amount of sticky notes was reduced in the last interview as in the second and third interview the interviewees were exhausted in evaluating the sticky notes, and there were a few duplicates. It was better not to have too many words on one sticky note, because it becomes too difficult for the interviewee to rate the note if the concepts on one note are too different from each other. Evaluating the keywords on sticky notes revealed a lot new information on the preferences of the interviewee. The interviewees rated many viewpoints less important than interpreted by the interviewer. About 20-25% of the sticky notes were evaluated as not important, and discarded.

When the interviewees were asked to talk while rating the notes, the process became much more insightful, as they would explain what they thought about the word. This also multiplied the time spent on evaluating the sticky notes, and in two interviews there was no time left for the categorisation. This was considered a lot smaller flaw than not hearing the process of rating the notes. Two of the interviewees started to categorise the sticky notes already at the same time when evaluating them, which was not seen important to be interfered. In the interviews, where there was enough of time for the categorization at the end of the interview, the categorization was actually not considered to reveal much new information.

Learnings from analysing the results. The sticky notes summarised the most important findings of the interview well. Listening to the recordings and writing down the findings was tiresome. Two interviews that were conducted first, were the only ones listened through again to memorize the discussion. A few new points were written on sticky notes. The benefit of listening through the recording was considered not to bring much new information, and therefore the two other interviews conducted right before the analysis were considered to be remembered well enough, and not to require to be revisited.

Table 12. Profiles of users studied with the interactive feature conceptualisation.

	Gender	Age	Situation	Theme / pattern of the wallcovering	Housing
User 1	Female	20-25	Bought wallpaper and installation (1 y ago), motif from selection	Turquoise wallpaper with golden spots reflecting light	Parent's new apartment, one wall in living room
User 2	Male	25-30	Planning to order/buy wallpaper and installation, or real bricks	(New) brick wall	Own new apartment, one wall in the living room
User 3	Female (at a company)	25-30	Ordered two custom wallpapers and installation for two rooms at office, images from photo gallery	Spruce forest with sunlight, bookshelf	New office, one wall in meeting room and all walls in quiet "library room"
User 4	Male	70-80	Ordered a custom wallpaper and installation, own photo	Wife swimming in the sea with water reflecting sunlight	Own old apartment, one wall in day room

Appendix E: Summary of findings to three research questions

Table 13. Summary of findings to the first research question “What is the role of users and customers in innovation process?”

Literature research (CH 2)	Benchmark company interviews (CH 3)	Focal company interviews (CH 4)	New user research for Digital Wallcovering (CH 5)
<p>Who are users and customers? -Terms user and customer are used in parallel. Term user is used in human-computer interaction, and term customer is used in management literature -Difference is in the focus of discussion: with users, the focus is in usability of the product design (International Organization for Standardization, 2009); with customers, the focus is in the market potential (Cooper, 2001) -Lead user term is used for users with strong needs, presenting the future of the marketplace (Hippel, 2004)</p>	<p>Who are users and customers? -People from innovation management and product development departments, who were developing new product innovations, defined user and customer as clearly different: the user is the one to get the final product, while the customer is the business customer. -People in sales and marketing, who were working with existing products or products in commercialization, did not find it relevant to talk about users and customers separately.</p> <p>Phase of interaction with users and customers: -The phase, where the interaction was the most intense could not be studied through these interviews in a trustworthy manner.</p>	<p>Who are users and customers? -R&D department considered user and customer as different: user is the consumer who uses the finalised product, and the customers are the direct business customers to refine the product. -The sales department used the term customer from everyone in touch with their product: the business customers, retailers, professionals, and consumers.</p> <p>Phase of interaction with users and customers: -Interaction with consumers was at its highest in the beginning of the innovation process, when looking for new market opportunities, and in the end of the product development phase when testing the product qualities and looking for sales arguments. -Business customer interaction was high in the commercialization, when promoting the new product and sending trials.</p>	<p>Who are users and customers? -Depending on the method, different terms were used to talk about the users and customers. -In business customer interviews, the term used was customer, because the digital printers were used to use that term. -In netnographic research on the online customer review site, the term was again customers, because it was the term the online site used from the people giving the reviews. -In interactive feature conceptualisation, the term used was user, because the question was about individual people, and their experiences related to the product. -When communicating the results to the focal company A, the term end user was used to highlight that the question was about the individual people, who procure the product to their homes, in contrast to the business customers - the digital printers.</p>

<p>Phase of interaction with users and customers:</p> <ul style="list-style-type: none"> -Users should be integrated throughout the whole design and development process of a new product, system or service (International Organization for Standardization, 2009) -The interaction has most positive impact on the product success in the front end of innovation, prototype testing and commercialization (Gruner and Homburg, 2000) -Empathic design methods should be used in the front end of innovation, particularly in the concept search phase (Koskinen and Battarbee, 2003) 			<p>Phase of interaction with users and customers:</p> <ul style="list-style-type: none"> -The phase of interaction with the users was at the commercialization of Digital Wallcovering.
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Table 14. Summary of findings to the second research question “What kind of value could new user research bring in commercialization?”

Literature research (CH 2)	Benchmark company interviews (CH 3)	Focal company interviews (CH 4)	New user research for Digital Wallcovering (CH 5)
<p>-Importance of users and customers in innovation process is unquestionable. The interaction has a positive impact on product success (e.g. Gruner and Homburg, 2000).</p> <p>Recognised value in commercialization (10):</p> <ul style="list-style-type: none"> -Product positioning -Creating awareness -Using customers as a reference -Improving the first release of a product -Determining tactics to increase purchase intensity -Understanding issues of repurchase -Reacting to the changed needs in the market -Getting feedback from pioneering users -Measuring the demand through collective customer commitment 	<p>Value of user and customer interaction in commercialization and after, categorised.</p> <p>1) Value of product fit (2):</p> <ul style="list-style-type: none"> -Ensure product fit to the needs, and context of use -Understand the whole context of use the product is part of <p>2) Value for sales (6):</p> <ul style="list-style-type: none"> -Collect interaction specific information from sales meetings to share in the company -Analyse the sales situation based on customer profiles -Salesperson knows which product to recommend to the customer -Convince the customer, and provide needed information and solutions for the whole procurement process -Argue for the product benefits from the customer’s viewpoint -Find new potential sales models -Create close relationships 	<p>Value of previous user and customer research before launch (3):</p> <ul style="list-style-type: none"> -Recognising new market opportunities and consumer needs -Ensuring usability (easy installation) of the product <p>Value of previous user and customer research after launch (1):</p> <ul style="list-style-type: none"> -Arguments for sales and marketing <p>Believed value of new user research after launch (8):</p> <ul style="list-style-type: none"> -Validate presumptions made of the user needs -Reasons, why the product doesn’t succeed in the market -Product arguments for consumer marketing material and sales meetings -Ideas how to refine the product positioning in relation to competitors -Find out the correct price for the product, and refine it if necessary -Understand purchase behaviour (how much and often it is purchased) -Recognize influencers of consumer’s purchase decision making -Understand the user’s world and thinking 	<p>Value of new user research for the focal company A, categorised by methods.</p> <p>Value of business customer interviews (2):</p> <ul style="list-style-type: none"> -Ideas for supporting services (instruction video of the installation) -Ideas for business customer collaboration (consumer marketing campaigns together) <p>Value of netnography (4):</p> <ul style="list-style-type: none"> -Recognising product features the consumers value (fast delivery, good quality, easy installation) -Understanding the profile of the consumers (cannot afford expensive papering, values personality, and desires a bit of luxury) -Arguments what to promote in marketing and sales (good quality and easy installation) -Things to consider in the business decisions (effectiveness of delivery channels) -Reference of perceived appropriate price -Validation of presumed user needs <p>Value of interactive feature</p>

<p>Potential value of empathic understanding in commercialization (3):</p> <ul style="list-style-type: none"> -Forming the right marketing message to evoke desired emotions -Retaining the future business, and affirming customer relationship -Helping the sales people to foresee the customer's individual situation and needs, and potentially to prepare acting on them and evoking the desired emotions. 	<p>Value for marketing (4):</p> <ul style="list-style-type: none"> -Direct and find new marketing channels -Understand different customer profiles and not overemphasize one in marketing -Create new tools for marketing -Form the company brand <p>Value of new business opportunities (4):</p> <ul style="list-style-type: none"> -Develop services alongside the product to improve customer satisfaction -Educating the company to become specialists, and foresee pitfalls -Understand what real people think, because the company is too experienced -Foresee new needs and trends, and launch new products on time, keep the status of a business shaper <p>Value of general good (3):</p> <ul style="list-style-type: none"> -Affect the everyday life of people -Be of help to the customers 		<p>conceptualisation (5):</p> <ul style="list-style-type: none"> -Understanding the problems and pain points of the user (hesitation the end result will not be good without a professional installation, hesitation if the pattern is right) -Understanding the meaning of the final result to the user (e.g. effect of the wallpaper for the atmosphere and reflection of the user's personality) -Influencers of purchase decision (e.g. too high price and difficulty of choosing the pattern slow down the decision) -Ideas for supporting material (inspirational material) -Arguments what to promote in marketing and sales (good quality, easy installation, and easy removal) -Validation of presumed user needs -Understanding the behaviour of repeated purchase (e.g. the result should last several years) -Understanding the user's world and thinking (e.g. memories, stories and meanings behind the pictures)
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Table 15. Summary of findings to the third research question “How should users be studied in commercialization? Which approaches should be applied to the focal company case?”

Literature research (CH 2)	Benchmark company interviews (CH 3)	Focal company interviews (CH 4)	New user research for Digital Wallcovering (CH 5)
<p>Recommendations for user and customer research:</p> <ul style="list-style-type: none"> -Research should varied methods (Hyysalo, 2009) -Methods from all three categories should be included: what people say, what they do, and what they feel and dream (Sanders and Dandavate, 1999) -Questions to consider: 1) what information is needed (for the project and the whole company), 2) which resources are available (know-how, tools, time and money), 3) which methods and capabilities can be applied or created, 4) what is the maturity of the technology, and 5) how similar the new users are from the current users (Hyysalo, 2009) 	<p>Recommendations for user and customer research:</p> <ul style="list-style-type: none"> -Share the same definition of user and customer in meetings -Interact with all players in the value chain -Include methods to learn about personal lives -Use several different kinds of methods -Share the understanding inside the company <p>Recommendations for usable methods for commercialization (7)</p> <ul style="list-style-type: none"> -Evenings for professionals -Internal workshops with sales and R&D -Video diaries -Testing the product at user's home -Customer feedback through customer call center -Mystery shopping -Meetings with the customer, and systematic collection of the information 	<p>Recommendations for effective use of user and customer understanding:</p> <ul style="list-style-type: none"> -Share the same definition of a user and customer of a product between the departments -Enough and diverse information of end users should exist in the company -Share the information efficiently between the departments, and people should know how to access the information if needed -Departments should discuss together on the business decisions (potential costs and profits of the new product) <p>Restrictions for choosing the methods for the focal company A:</p> <ul style="list-style-type: none"> -Consider limited resources and expertise -Aim for new understanding -Focus on individual people 	<p>Suitability of the methods for the focal company A, categorised.</p> <p>Business customer interviews:</p> <ul style="list-style-type: none"> -<i>nature of the findings:</i> contextual understanding of business, most generalisable and statistical information, needs support from more insightful methods -<i>advantages:</i> contact to many business customers already exists, possibility to ask questions, business customers eager to help and discuss -<i>disadvantages:</i> time consuming, no personal stories or experiences, a lot of content already known, requires sensitivity because of the business relationship

<p>Limitations of traditional market research in commercialization (9):</p> <ul style="list-style-type: none"> -Poor representation of a great number of people -Emotions and thoughts are not discovered -Limited representation of the real-life context -Poor evaluation of real purchase behaviour -Little information about the future -Users' have a limited knowledge -Neglecting the desired experience of an individual customer -Listening too intensively to the current market 			<p>Netnography, online customer review site:</p> <ul style="list-style-type: none"> -<i>nature of findings:</i> observational, allows statistical analysis, needs support from more insightful methods -<i>advantages:</i> big amount of data, data easily accessible, fairly fast and lightweight, natural content -<i>disadvantages:</i> risk for superficial information, content restricted by terms and conditions, impossible to ask questions <p>Interactive feature conceptualisation:</p> <ul style="list-style-type: none"> -<i>nature of findings:</i> analytical, information about user's world, thinking and feelings, needs support from statistical methods -<i>advantages:</i> spontaneous answers, allows asking questions -<i>disadvantages:</i> most time consuming of the three methods, suitable users hard to find
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